



Vietnam

SOLAR ENERGY PROFILE

Energy, and an Economy, in Transition

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SOLAR
MAGAZINE

Vietnam Solar Energy Profile

Energy, and an Economy, in Transition

Vietnam's power sector has been expanding alongside its economy—at USD223.9 billion in 2017—one of the **20 fastest growing** in the world with year-over-year growth rates ranging from above 5 percent per year to 7.1 percent from 2013 through year-end 2018.

Solar and other renewable energy resources figure to play a growing role in the country's energy mix, but transitioning to an economy and society centered on emissions-free, environmentally friendly energy resources appears more than likely to take a back-seat to ensuring economic growth continues, accompanied by an increasing reliance on coal- and natural gas-fired power generation.



State-owned utility Electricity of Vietnam (EVN) anticipates some USD123.8 billion will be invested in development of Vietnam’s national power system **within the next 20 years**, according to a February 2019 Vietnamese news report. According to the latest revision to Vietnam’s national Power Development Plan VII, an average USD6.8 billion per year will be invested in the sector over the period. Two-thirds of this is expected to be invested in power plants, with a remaining 33.4 percent invested in grid network development.

Solar power accounts for a negligible percentage of electricity generation in Vietnam, around 0.01 percent of national output, according to a September 2018 Vietnam solar power **market briefing** from international law firm Dezan Shira & Associates. **A tremendous amount of untapped solar energy resource potential exists in Vietnam, however.** Estimates have pegged the country’s solar power potential at 60–100 GWh per year for concentrated solar power and 0.8-1.2 GWh per year for solar photovoltaic (PV) energy.

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Chapter 1: Solar energy and project development in Vietnam

In common with its ASEAN (Association of Southeast Asian Nations) peers, the Vietnamese government has relatively modest goals when it comes to raising renewable energy resources' share of national power generation. Collectively, the 10 nations that make up ASEAN are home to some 650 million people, 14.3 per cent and 8.5 per cent of Asia's and the world's population respectively. Yet ASEAN accounts for just 6.6 percent of Asia's and 2.8 percent of renewable power capacity **installed worldwide**, Assaad Razzouk, group chairman and co-founder of Singapore-based clean energy company Sindicatum Sustainable Resources, writes in a March 18 op-ed. Furthermore, ASEAN's share of installed global renewable power capacity peaked in 2012 and has dropped 24 percent since, Razzouk added.

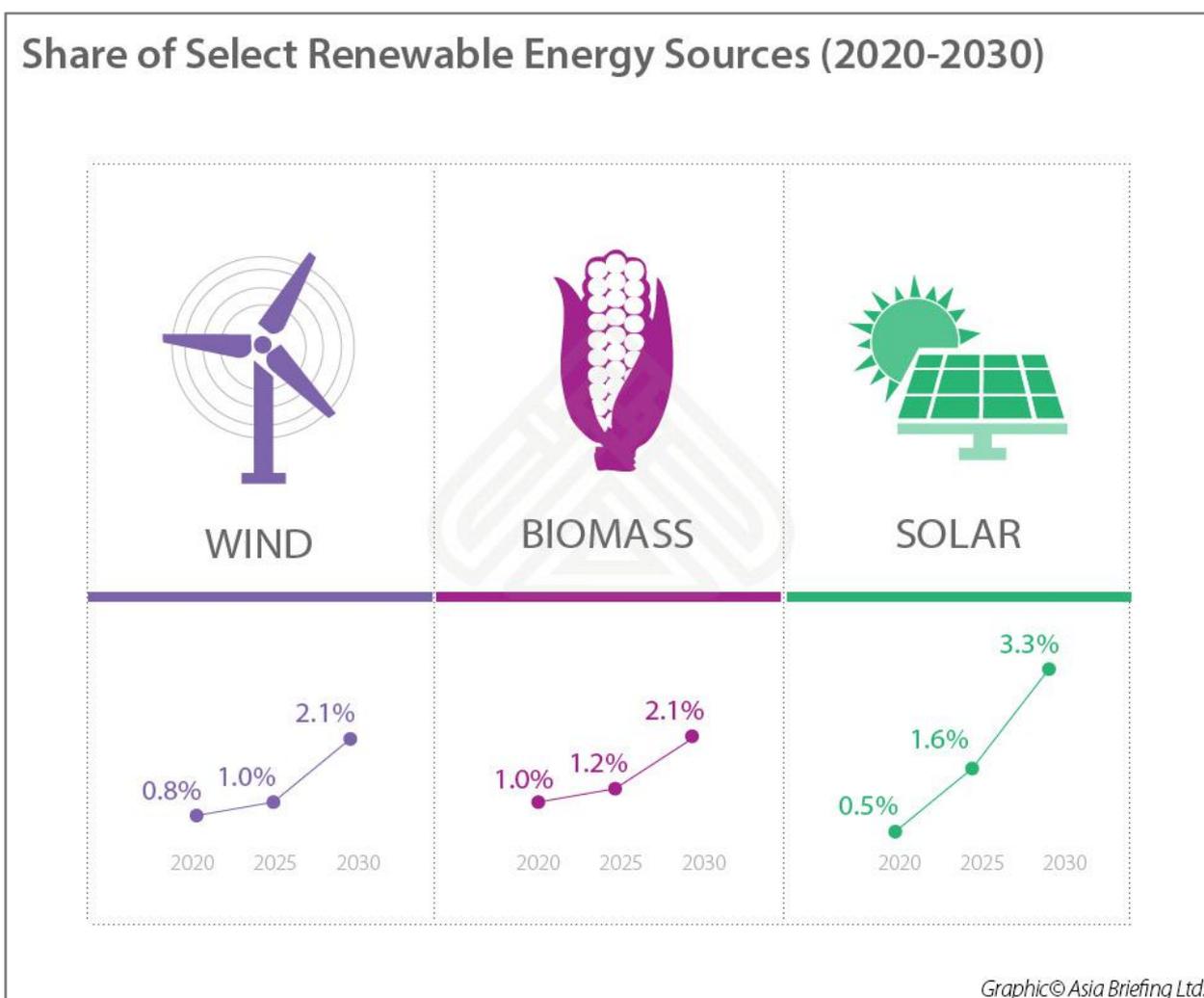
Summary of Existing Supporting Mechanisms for Renewable Energy

Generation sources	Technology	Tariff	Electricity sale price
Small hydro power	Electricity production	Avoided cost tariff published annually	598-663 VND/kWh (by time, region, season) 302-320 VND/kWh (surplus energy vs contracted) 2,158 VND/kWh (capacity price)
	Co-generation	FiT for 20 years	5.8 USc/kWh
Wind power	Electricity production	FiT for 20 years	7.8 USc/kWh (on land)
	Electricity production	FiT for 20 years	7.5551 USc/kWh (North) 7.3458 USc/kWh (Central) 7.4846 USc/kWh (South)
Biomass	Direct burning	FiT for 20 years	10.5 USc/kWh
	Landfill for gas production	FiT for 20 years	7.28 USc/kWh
Waste	Grid-connected generation	FiT for 20 years	9.35 USc/kWh
Solar power			

Data: Summarized from many legal documents on RE supporting mechanisms; Avoided-cost tariff referred in 2017.
Source: Vietnam Energy Outlook Report 2017 (Danish Energy Agency)

Hydroelectric power generation has **long been, and continues to be**, Vietnam’s primary renewable energy resource, but most of the nation’s hydro-power resource potential has been exploited. Totalling 18 GW as of 2015, Vietnam’s hydroelectric generation capacity is expected to increase to about 21.6 GW in 2020 nonetheless.

Turning to solar, Vietnam’s government aims to raise solar power capacity to 0.5 percent of national output by 2020, 3.3 percent by 2030 and 20 percent by 2050. It’s targeting 850 megawatts (MW) of installed solar power generation capacity by 2020, 4 gigawatts (GW) by 2025 and 12 GW by 2030.



Source: Renewables in Vietnam: Current Opportunities and Future Outlook (EVBN)

Moving to realize those goals, the introduction of a solar feed-in tariff (FiT) in April 2017 has led to a large-scale solar power project **pipeline of 20 GW**. That's about half the country's installed power generation capacity, Rystad Energy highlights in a September 2018 RenewableCube newsletter. In addition, there are "thousands of small, off-grid solar power systems in operation, mainly in rural and remote areas" of Vietnam, Hogan Lovells, an international law firm, points out in its Renewable Energy in Vietnam 2018 report.

Commissioning large-scale solar power projects by a June 2019 deadline to qualify for government solar FiT incentives will be challenging, according to Rystad. "While it's likely some projects will make this deadline, grid connection and commissioning for many likely won't happen until after. Furthermore, there is little experience or technical expertise in Vietnam to deliver projects of this scale on such a short timeline," according to the independent energy consulting services and business intelligence data provider.

That said, China's JA Solar on Feb. 21 announced it had supplied 48.3 MW of **PERC (Passive Emitter Rear Cell) PV modules** for the 48.3 MW BP Solar 1 power plant in a coastal area of southeast Ninh Thuan Province, which engineering, procurement and construction contractor (EPC) Bac Phuong Joint Stock Co. recently completed ahead of schedule. The grid-connected, utility-scale project, which was brought online on January 20, is the first to make use of higher efficiency, bifacial PERC panels and is expected to generate 80 million kilowatt-hours (kWh) of electrical energy while avoiding 79,760 tons of carbon dioxide emissions per year.

Connecting solar, wind or other renewable power generators to the national utility grid is another major obstacle for project developers, however.

Vietnam, for example, claims (and is commonly perceived) to be a leader in renewable energy, while in reality its leaders have been pushing coal. Its current power development plan does not indicate any transition away from fossil fuels and proudly projects that future electricity demand will be met by more polluting fossil fuel sources. For instance, coal will increase to 53 per cent of its energy mix in 2030, up from 33 per cent in 2016.

—Razzouk writes in his March op-ed.

“To compound the mystery, Vietnam is inviting more investments in its solar sector with feed-in tariffs that are attractive on the surface. But the result is this increased capacity cannot be handled by the current transmission infrastructure and therefore is guaranteed to lose investors a lot of money.”

Chapter 2:

Power generation in Vietnam: A major expansion in the making

As is the case in many countries around the world, whether developed, developing or lesser developed, Vietnam's government-run utility and its ownership of fossil-fuel power plants, poses one of, if not the biggest barriers to fostering development and growth of solar, wind and other emissions-free renewable energy resources in the country.

There are 73 power plants—hydro, thermal, gas and renewables—up and running in Vietnam at present, according to VietnamNet's February 2019 report. Forty-eight have a power generation capacity greater than 30MW. Nearly all were built, and are owned and operated, by EVN.



Looking ahead, there are plans to invest in building **as many as 98** new power plants with a total capacity of 59,444 megawatts (MW), according to the U.S. International Trade Administration (ITA). EVN plans to build 48 of them with a total power generation capacity of 33,245 MW at a projected cost of USD 39.6 billion.

EVN is able to self-finance or raise debt financing for just two-thirds of the investment capital required, VietnamNet points out. EVN and the Vietnamese government are looking to independent power producers (IPPs), including foreign investors, to provide the remaining third, possibly more.

Unfortunately for solar and clean energy proponents and supporters, much of this is likely to **come in the form of** coal-fired power plants. Fitch Solutions expects coal-power generation growth to increase rapidly in Vietnam over the next decade and dominate Vietnam's power-sector expansion. "We forecast coal-powered generation to grow at an average of 10.1% y-o-y to reach about 50.5 percent of the power mix by 2028," Fitch projects. Coal-fired power generation accounts for around one-third of Vietnam's power generation capacity at present.

The credit analysis and rating agency points out that there are downside risks associated with Vietnam increasing its use of coal as a power-generation resource, due in particular to mounting environmental concerns, as well as Vietnam commitment to meeting U.N. Sustainable Development goals and carbon intensity-based greenhouse gas (GHG) emissions reductions goals as a party to the U.N. Paris Climate Agreement, however.

Chapter 3:

Foreign participation in solar power development

Arguments that solar and wind power are unreliable or too expensive are difficult to justify as they are now cost-competitive with conventional, fossil-fuel generation—given a regulatory and institutional framework that makes for a level energy market playing field. And that's not taking account of the rising toll climate warming and environmental pollution is taking on human and environmental health and quality, a growing concern across the ASEAN region.

The falling cost and fast-growing deployment of battery-based energy storage in leading countries around the world adds to the feasibility of transitioning to zero-carbon energy. All that makes government and utility allegiance to centralized fossil-fuel and nuclear power generation questionable and suspect.

In spite of, or perhaps because of this, multilateral development banks, foreign aid and development agencies, multinational solar and renewable energy industry players and investors have been and continue to express interest in helping develop and grow Vietnam's solar and renewable energy capacity. The World Bank in June 2014 approved a USD200 million loan and USD70 million credit to support the Vietnamese government's power sector reforms, as well as climate resistance and development programs that should help Vietnam achieve its lower carbon-intensity, U.N. Paris Climate Agreement targets.



A solar power plant in Quang Binh Province, Vietnam

In 2016, the World Bank, the Asian Development Bank, the Japan International Co-operation Agency and the German Bank for Reconstruction made preferential loans to EVN amounting to USD1 billion. In addition, EVN has been working with France's international development agency in order to receive two additional loans for **the Se San 4** floating solar power plant project.

Chapter 4:

Barriers to solar market and industry development and growth

A lack of clearly defined, consistent market rules and regulations, as well as institutional capacity, hinders solar and renewable energy development and growth in Vietnam. That's especially the case when it comes to residential solar energy uptake, EVN Director General Tran Dinh Nhan was quoted as saying at a conference in Hanoi February 27 organized to identify ways of boosting rooftop solar energy installations.

Just 1,800 Vietnamese households have installed rooftop solar power systems (total power capacity of 30 MW) over the past two years, according to the Vietnamese news report.

The high, up-front cost of investment, along with cumbersome requirements regarding payments, devices and equipment, serve as barriers to greater adoption, Nhan reportedly said at the conference. Insufficient information, knowledge and confidence in the nature and quality of solar PV equipment and devices adds to Vietnamese households and businesses' reticence to install solar power systems, according to the report.

EVN Deputy General Director Dinh Quang Tri has proposed the government subsidize local household purchases of rooftop solar power systems and institute preferential policies for those who invest in solar power projects. Tri also proposed that Vietnam's Ministry of Industry and Trade move quickly to amend its so-called Circular No.16 so as to enable EVN and its subsidiaries to sign official contracts and make payments for solar power produced by utility customers. Among other items, Circular 16 includes a set of three templates of model power purchase agreements (PPAs) for grid-connected projects, residential rooftop and commercial-industrial rooftop projects.



Speaking at the conference, an EVN representative said the state-run utility is negotiating with German international development bank KfW, which is interested in sponsoring EVN to the tune of €14 million (~USD16 million) to develop solar power projects. EVN has proposed the investment capital be set aside to install residential rooftop solar PV systems. Each qualifying household would receive VND2 million–6 million (~USD86–259) depending on systems' generation capacity, according to the news report.

Dispute resolution rules and procedures that foreign or international solar and renewable energy project development and investment groups **consider unfair** also figure prominently among such issues. “Dispute resolution by the Vietnamese authorities or state agencies may not be viewed as an impartial mechanism, particularly in view of EVN being a state-owned entity related to the regulator,” according to a January 2018 study produced by international law firm Hogan Lovells' Vietnam office. “The ability to refer a dispute to the Vietnamese courts may also not provide enough adequate comfort with regards to impartiality.”

Chapter 5:

A pivotal point for solar, renewable energy in Vietnam

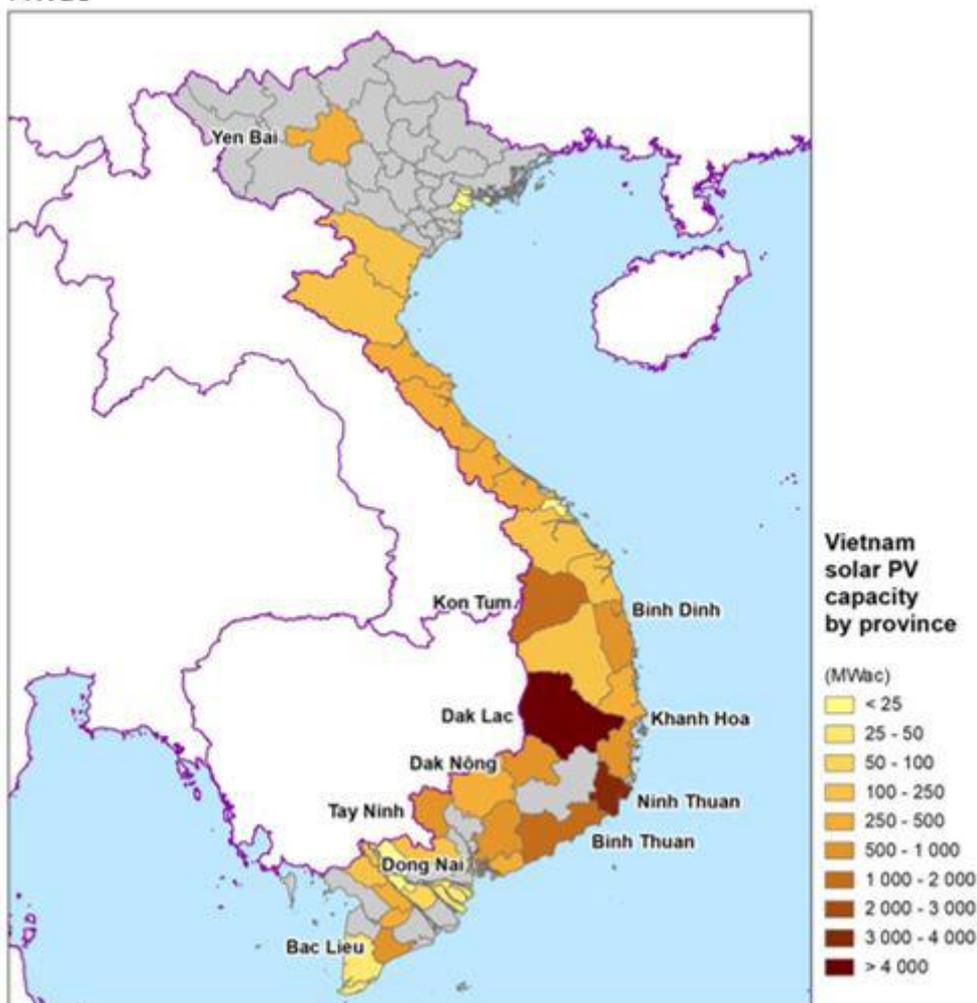
All that said, Vietnamese government authorities and EVN appear committed to fostering development and growth of solar and renewable power across the country, and they're learning and seeking to gain from lessons learned from the experiences of governments in countries and states, such as Germany, Spain and the U.S., in designing and instituting new, more effective and less costly solar and renewable energy policies and programs.

Consumer demand for energy in Vietnam is expected to increase more than 10 percent by 2020 and four-fold by 2030 as compared to 2014's level. "To meet the growing demand, which cannot be fulfilled by sources like coal and hydro, the government is promoting other renewable sources, such as biomass, solar and wind, to reduce the gap between demand and supply," according to Dezan Shira's 2018 Vietnam solar power market briefing.

Dezan Shira highlights Vietnam's tremendous solar energy resource potential. Some 1,600–2,700 hours of sunlight falls on Vietnam in a typical year. Average direct normal irradiance (DNI), a measure of the solar energy that reaches a unit area of land at a perpendicular, 90-degree angle, ranges between 4–5 kWh/m².

Vietnam's large-scale solar potential capacity by province

MWac



Source: Rystad Energy SERA Tracker

Foreign investors and governments continue to express interest in helping develop Vietnam's solar energy resource potential. "Germany believes in the nation's [Vietnam's] great potential for renewable energy, both from solar and wind power. Furthermore, there are immense opportunities for investors to develop these projects," German Ambassador to Vietnam Christian Berger was quoted in a February 2019 Vietnamese [news report](#).

Marking a pivotal point for the development and growth of solar and renewable energy in Vietnam, the Ministry of Industry and Trade (MOIT) has said it will implement a new, national solar feed-in tariff (FiT) program to **take effect July 1, 2019**, according to a March 1 industry news report.

Chapter 6:

The latest draft of Vietnam's solar FiT 2

MOIT issued a revised draft of Vietnam's second, two-year solar FiT on Feb. 22. In contrast to the first version, Vietnam's solar FiT 2.0 would **set tariff rates for** solar power producers based on the location, as well as the power output, of generation facilities. A single, flat rate was applied to all projects as per Vietnam's initial solar FiT, international law firm Baker, Mackenzie's Vietnam practice highlights in a Vietnam draft policy update.

Vietnam's draft solar FiT 2 would also distinguish between various types of solar power installations. Generally speaking, solar power producers will be able to qualify for tariffs as high as the Vietnamese dong equivalent of USD0.1087/kWh. Floating, ground-mounted and solar-plus-storage installations will be able to qualify for tariff payments of USD0.0667 and USD0.0944 per kWh, respectively. These compare to USD0.0935 per kWh under the existing FiT scheme, which is slated to expire at the end of June.

According to the draft, solar power project developers will be able to sign 20-year power purchase agreements (PPAs) with EVN. Vietnam's recently established Electricity and Renewable Energy Authority is accepting and reviewing public comments regarding the draft until April 15.

In addition, Vietnam's government offers a variety of incentives designed to attract foreign investment in solar and renewable energy. Renewable energy projects are eligible for the following special investment incentives according to Vietnam's Law on Investment, Hogan Lovells points out. According to Hogan Lovells: "Under the Law on Investment, renewable energy projects are eligible for special investment incentives, as follows:

- Corporate income tax preferences: Income from new investment projects for renewable energy production will be subject to corporate income tax at the rate of 10% for the first 15 years. By comparison, the lowest corporate income tax rate available to regular companies is 20%.
- Import duty preferences: There is an exemption from import duty in respect of goods imported in order to construct or form fixed assets, such as raw materials, manufactured materials and other components.
- Land-related incentives: Investors may be entitled to exemption from the land use fee that would usually apply for 11 years or, in cases where the investment project is in a region facing extreme socioeconomic difficulties, 15 years. In addition, during the capital construction period of a project (being the period of construction of a new building or plant for up to 3 years from the effective date of the land lease contracts), investors are entitled to an exemption from land rents and water surface rents. Furthermore, land clearance compensations and support will be provided, in accordance with the Law on Land. All land lease and land allocation for renewable power projects are handled by the relevant provincial People's Committees."

There are also additional incentives for specific types of renewable energy projects, Hogan Lovells adds.

- “Foreign participation: There are currently no foreign ownership restrictions in relation to renewable energy projects. However, the renewables sector is predominantly locally invested and projects are generally equity financed or benefit from local bank financing (which may not be on a non- or limited-recourse basis as understood internationally). There are no precedents of internationally project financed renewables projects to draw from, although we understand that a number of foreign investors are looking at potentially significant development opportunities.
- Security over land and assets: In addition, the following should be borne in mind when financing a renewable power project in Vietnam. Under the Law on Land, security over ‘land and assets attached to the land’ may only be granted to credit institutions operating in Vietnam. In addition, where the project is exempted from land-use rental payments (which would be the case for a wind or solar project if the project company avails itself of the possible exemption), then it can only mortgage the assets attached to the land (and not the land use rights themselves) with credit institutions authorized to operate in Vietnam. Structuring options may be available, and this is an area where practice is evolving.” 

Read the Profile at: <https://solarmagazine.com/solar-profiles/vietnam/>

Appendix

The Story Behind Solar Energy Profiles

The solar energy industry has gained significant development over the past few decades, while making vast and impressive contributions to accelerating the transition to renewable energy, better addressing the climate change and creating a greener living environment for human beings. However, from a global perspective, the solar development is uneven—many regions in the world which have huge solar potential along with many benefits to residents lack a robust ecology comprised of various aspects including strong social awareness, consistent governmental support, mature technology systems, effective policies and regulations, and adequate capital. These regions are mainly in developing areas, like Africa, Asia, and South America, occupying a large proportion of the world’s population. In the meanwhile, there are still [some 1 billion](#) people across the globe have no electricity access; most of these people are living in rural communities of the areas mentioned above—many practices have proven that solar energy deployment is an ideal means to alleviate energy poverty.

Aiming to make the public to get to know more about and obtain good understandings of the potential, states, and obstacles of the solar energy development in these regions and areas, Solar Magazine launches the Solar Energy Profiles column and will publish profiles for different countries regularly. We will concentrate our efforts on the developing as well as the less developed countries first since they have received less attention. We hope that these profiles composed of official statistics, market analyses and expert insights can catch more attention from international policymakers, development organizations and associations, technology professionals, and investors to form a strong cohesion to accelerate the solar energy deployment and address the energy issues.

More Profiles: <https://solarmagazine.com/solar-profiles/>

