

Study

# MARKET INFO THAILAND – PHOTOVOLTAICS

dena-Market Information System

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# IMPRINT

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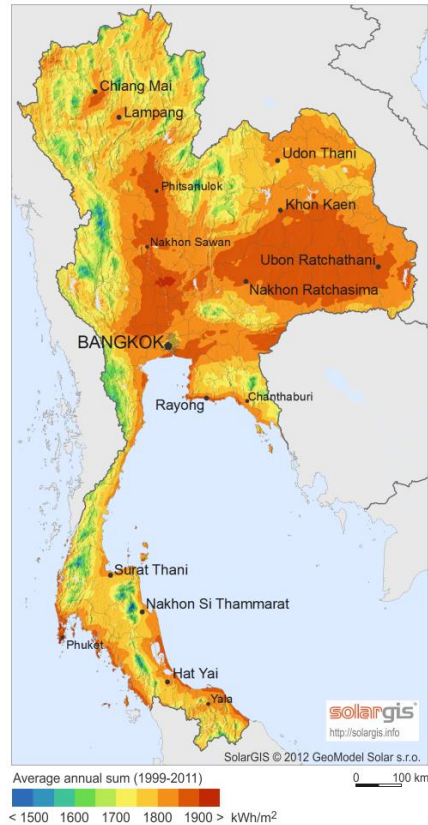


Federal Ministry  
for Economic Affairs  
and Energy

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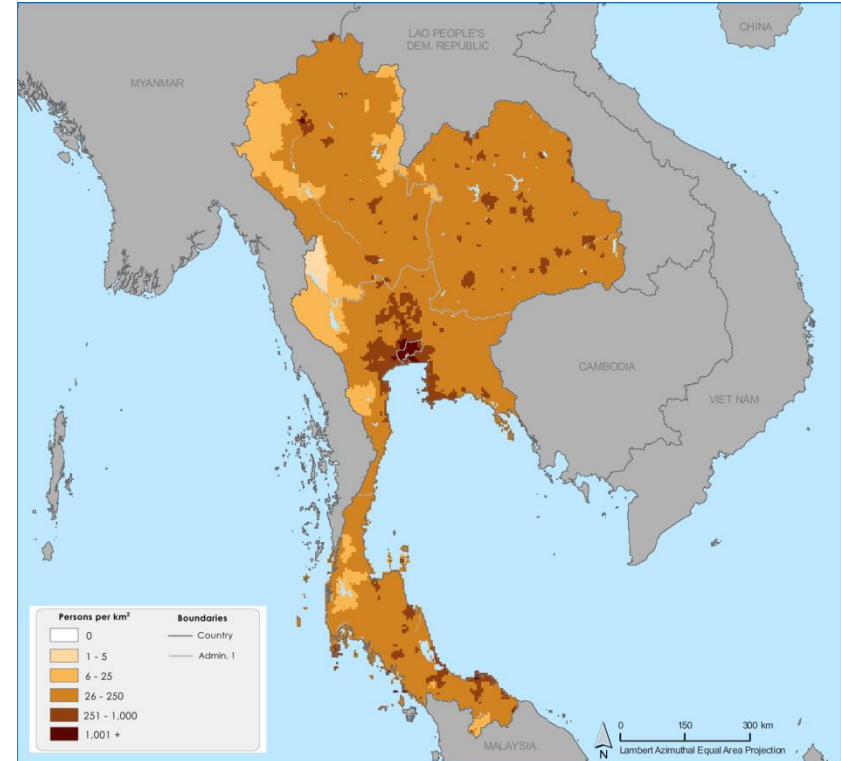
# SOLAR IRRADIATION & POPULATION DENSITY

Annual global solar irradiation



Source: SolarGIS (2012)

Population density



Source: SEDAC (2012)

# BASIC DATA

General basic data (2014)			
Area	513,120 km <sup>2</sup>	GDP (est.)	12,436 bn THB (~ 276.89 bn € <sup>**</sup> )
Population (est.)	68.6 m	GDP per capita (est.)	181,403 THB (~4,039 € <sup>**</sup> )
Language	Thai, English	GDP growth (est.)	2.5 %
Government type	Constitutional monarchy	Inflation (est.)	2.3 %
Administrative division	77 provinces	Unemployment rate (est.)	0.7 %
Basic energy market data (2012)			
Electricity consumption (total/per capita)	161.77 TWh/ 2,398.4kWh		
Total electricity import	10.52 TWh		
Total electricity generation	166.43 TWh		
Electricity price (industrial / PEA)	2.71 THB/ kWh (~0.068 €/ kWh*)		
Electricity price (industrial / MEA)	2.68 THB/ kWh (~0.067 €/kWh*)		
Electricity price (residential /PEA)	3.73 THB/ kWh (~0.093 €/ kWh*)		
Electricity price (residential/ MEA)	3.73 THB/ kWh (~0.093 €/ kWh*)		
Share of renewable energy (electricity consumption)	6.1 %		
Increase of electricity consumption (2010 - 2030)	4.13 % p.a.		
Annual average global solar irradiation	1,900 kWh/ m <sup>2</sup> a		

\* Annual average exchange rate 2012 of the European Central Bank (ECB): 1 € = 39.93 THB, \*\* Exchange rate March 2014: 1 € = 44.913 THB

# PHOTOVOLTAIC MARKET INDICATORS

Indicators			
Market size (annual installed capacity)	2013: 691 MW	2014e: 50 MW	2015e: 700 MW
National PV target	Alternative Energy Development Plan (AEDP 2012 - 2021): 2,000 MW of installed PV capacity by 2021, half of this capacity should be smaller sized systems like PV rooftop systems for households, apartment buildings, industrial installations and public buildings. By the end of 2014 an additional 1,000 MW of PV capacity is going to be implemented within a new FIT programme.		
Main market drivers 2014	In 2013 the Asian Development Bank (ADB) started two new credit lines to co-finance and support the development of ground-mounted PV power plants. 1,000 MW of PV capacity are supposed to be added by the end of 2014. Market driver will be the FIT scheme from July 2013 (see next slide).		
Recent changes in PV regulation	<ul style="list-style-type: none"> <li>• November 2014: The dissolution of the Thai government in early 2014 has halted residential rooftop solar installations. PV installers are waiting for regulations concerning selling energy to the grid and residential rooftop permits. Most recent data from July 2014 suggests that little more than 50 MW of rooftop solar PV applications have been approved so far due to the lack of permitting. In total, there are more than 6,000 residential PV applications awaiting approval.</li> <li>• July 2013: to support the PV market, the Thai Government has improved the policy framework as well as the investment incentives within the scope of the new FIT in 2013.</li> <li>• May 2013: The DoE revoked at the end of May approx. 500 MW of approved PV licenses and 700 MW of PV capacity will follow soon.</li> <li>• If all the PV licenses are revoked, the DoE will open the new FIT programme for new PV applications in 2013.</li> </ul>		

# MAIN SUPPORT SCHEME: FIT PROGRAM 2013

Support scheme	Details
FIT Program 2013	<ul style="list-style-type: none"> <li>▪ The national Thai Energy Commission (NEPC) approved a FIT for PV systems at the beginning of July 2013.</li> <li>▪ New installations of 1,000 MW (200MW rooftop systems by the end of 2013, 800 MW ground-mounted systems by the end of 2014) should be facilitated by this new incentive. So the PV goal is expanded to a capacity of 3,000 MW.</li> <li>▪ Funding will be provided over a period of 25 years.</li> <li>▪ The tariff for roof top system varies according to peak loads. System operators who wanted to receive the FIT for roof-top systems, had to commission these by the end of December 2013.</li> <li>▪ Operators could apply for funding until 11<sup>th</sup> October 2013 with the Provincial Electricity Authority (PEA).</li> <li>▪ The phased tariff for PV ground mounted systems varies depending on the year of operation and is applicable for projects with a capacity of up to 1 MWp, which are community owned. Per community max. 1 MWp will be funded. The regulatory framework for this tariff is currently being developed. It is aimed at commissioning all PV systems with a total capacity of 800 MW at the latest by the end of December 2014.</li> </ul>

Tariff for roof-top systems up to 1 MWp	
Systems capacity	Tariff
≤ 10 kWp	6.96 THB/kWh (0.17 €/kWh*)
11 - 250 kWp	6.55 THB/kWh (0.16 €/kWh*)
251 kW - 1,000 kWp	6.16 THB/kWh (0.15 €/kWh*)

Tariff community ground-mounted systems up to 1 MWp	
Year of operation	Tariff
1-3	9.75 THB/kWh (0.24 €/kWh*)
4-10	6.50 THB/kWh (0.15 €/kWh*)
11-25	4.50 THB/kWh (0.11 €/kWh*)

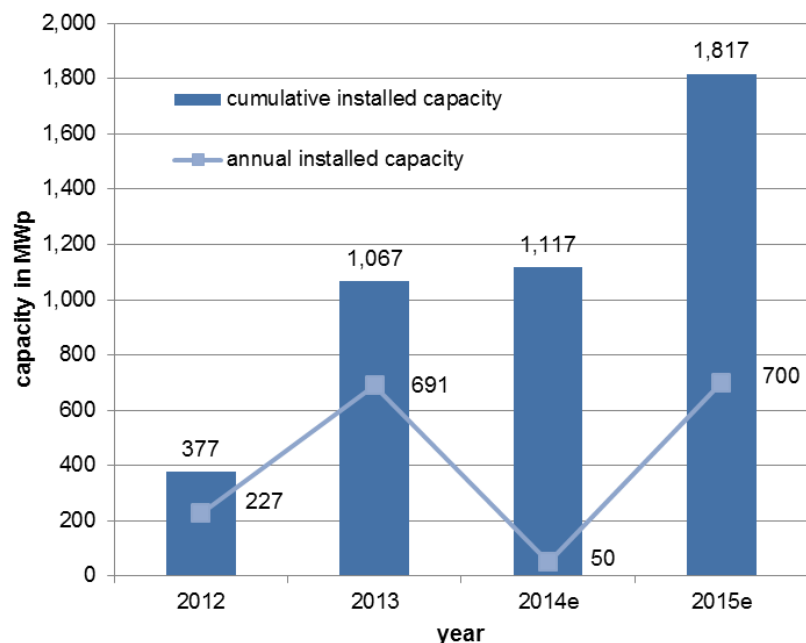
\* Exchange rate from 25th July 2013 : 1 € = 41 THB

# OVERVIEW OF OTHER PV SUPPORT SCHEMES

<p><b>Adder tariff program (expired)</b></p>	<p>In 2010 the premium tariff (adder) was revised the last time: The recent adder is only effective for PV installations approved before 31<sup>st</sup> of December 2010. Since June 2010 no more application for PV projects were accepted. Operators of on-grid PV systems receive a premium tariff from the DoE. Annual revisions of premium tariffs will be approved by the National Energy Policy Committee (NEPC). Operators of PV systems with a capacity up to 10 MW receive an adder of 6.5 THB/ kWh (~ 0.16 €/kWh) for ten years as a premium in addition to the electricity price. The adder will increase by 1.5 THB/kWh (~0.03 €/kWh) for PV systems, which are installed in the southern provinces Yala, Pattani or Narathiwat or for hybrid systems with diesel generators.</p>
<p><b>Public tender &amp; soft loans in 2013</b></p>	<p>In 2013 the Asian Development Bank (ADB) started two new credit lines to co-finance and support the development of ground-mounted PV power plants. With the “Central Thailand Solar Power Project” representing a credit volume of 87 m THB (~ 2,1 m €) 57 MW of new PV capacity shall be developed. This capacity will be tendered through public bidding rounds and will receive the fixed adder. With the “Provincial Solar Power Project” the ADB supports 50 MWp of new capacities in the provinces Chaiyaphum and Ayutthaya with a sum of 40.2 m THB (~1 m €). This capacity target will also be tendered in public bidding rounds and will receive the fixed Adder.</p>
<p><b>Exemption from import tariffs and company taxation</b></p>	<p>The Thailand Board of Investment (BOI) exempts companies from import tariffs, which import PV modules and PV system components. PV system operators receive an 8-year exemption from company taxation .</p>

# MARKET DEVELOPMENT AND BARRIERS

## Development of installed PV capacity (on-grid)



Sources: TPVA (2012), IHS Solar (2013) in PV-Magazine (2014)

projection 2015: dena (2014)



## Main barriers in the Thai PV market

### PV support 2013 / dissolution of the Government

- Since June 2010 no more applications for PV projects were accepted (adder). Since then an approval stop for 3 GW of PV capacity was introduced. At the end of May 2013 the DoE revoked approx. 500 MW of approved PV licenses. With cancelling all PV licenses, the DoE opened the FIT programme 2013 for new PV applications.
- The FIT scheme from July 2013 for roof-top installations expired at the end of 2013. The approval of FITs for ground-mounted community-owned systems (which will be granted until the end of 2014) is uncertain. As things are now there will be no further promotion for PV in Thailand from 2015 onwards (lack of legal certainty).
- The dissolution of the Thai government in early 2014 has halted residential rooftop solar installations. PV installers waited for regulations concerning selling energy to the grid and residential rooftop permits.
- Most recent data from July 2014 suggests that approx. 50 MW of rooftop solar PV applications have been approved. The Government intended growth of new installed PV capacity in 2014 will delay to 2015.



# MARKET NEWS (1/4)

Date	Topic	Source
22/08/2014	<p><a href="#">Thailand set for \$1.4bn renewables boost</a></p> <p>Thailand's promising solar industry received a welcome boost this week with the news that a leading domestic clean energy developer is set to invest \$1.4 billion into the country's renewable energy sector. Bangkok-based Energy Absolute Pcl has announced its intention to develop a number of renewable energy projects in Thailand over the course of the next three years, with large-scales solar PV projects totaling 180 MW foremost in those plans. Energy Absolute already owns Thailand's largest solar PV plant (a 90 MW solar plant in Nakhon Sawan province), and hopes to add 570 MW of clean energy generating capacity to the national grid by 2017.</p>	PV-Magazine
30/07/2014	<p><a href="#">Kyocera, SPCG complete 257 MW of solar farms in Thailand</a></p> <p>Japan's Kyocera Corporation and Thai solar developer SPCG have begun operation of one of the largest PV power projects in Southeast Asia. The 257 MW project in Thailand consists of 35 solar farms that have been constructed since 2010. The completed project has been connected to the grid in northeastern Thailand.</p>	PV-Magazine

## MARKET NEWS (2/4)

Date	Topic	Source
17/07/2014	<p><a href="#">Thailand dusts off renewable energy plans as unrest subsides</a></p> <p>Recent political clashes pushed renewable energy to the back burner, but the new energy boss plans to reignite the sector. Thailand's months of political turmoil – which culminated in a military coup on 22<sup>nd</sup> May – may have punctured economic growth in each of the country's main industries, but signs are emerging that ruling military officials are keen to restart some of the previous government's policy targets, including those related to renewable energy.</p> <p>The country's previously soaring solar PV sector has been particularly hard hit, but newly appointed director general Viraphol Jirapraditkul has said this week that the Alternative Energy Development and Efficiency Department will reignite Thailand's renewable energy landscape, beginning with a revamp of the feed-in tariff (FIT) and reintroduction of tax breaks for installers of solar power.</p> <p>The ruling regime sees solar energy projects as key to attracting foreign investment scared off by recent events. Having launched a solar rooftop scheme in September last year, the target was to have installed 200 MW of rooftop capacity by now. As it stands, just 100 MW is scheduled to come on stream, and the country is falling some way short of its aim to reach almost 14 GW of renewable energy by 2021.</p> <p>However, the most recent data suggests that little more than 50 MW of rooftop solar PV applications have been approved so far due to a lack of permitting. In total, there are more than 6,000 residential PV applications awaiting approval.</p>	PV-Magazine
27/01/2014	<p><a href="#">Sharp signs EPC and supply agreement for 52MW Thai PV project</a></p> <p>Sharp has signed an engineering, procurement and construction (EPC) contract to construct a 52MW DC photovoltaic (PV) plant in Thailand for Thai company Serm Sang Palang Ngan (SSP). The plant will be built in the Lop Buri province, around 150km north of Bangkok. Construction is expected to begin this month, scheduled for completion by the end of 2014. Sharp will also supply 400,000 silicon (a-Si) thin-film modules to the installation as well as balance of system (BOS) components.</p>	PV-Tech

## MARKET NEWS (3/4)

Date	Topic	Source
17/01/2014	<p><a href="#">Political unrest hinders Thai rooftop solar</a> The dissolution of the Thai government last month has halted residential rooftop solar installations. Installers are waiting for legislation needed to sell energy to the grid and the issuance of residential rooftop permits.</p>	PV-Magazine
01/11/2013	<p><a href="#">Thailand: Easing of residential solar requirements</a> The Thai government is reportedly preparing to make it easier for households to install solar plants on rooftops. An easier permitting regime could be put before government for approval on Tuesday. Bangkok-based English language newspaper The Nation has reported the Thai government is considering relaxing the rules relating to household solar systems. Under the current Thai regime, domestic installations require an industrial license, but The Nation reported yesterday the government's Industrial Works Department is considering removing the requirement for household systems generating up to 20 kW.</p>	PV-Magazine
16/10/2013	<p><a href="#">Thailand to transfer quota to rooftop if farms not operational</a> To reach its government quota for solar generated power, Thailand may look to rooftop installations, should solar farms fail to complete commercial operation by December 2013, according to local news reports. The Thai government aims for 2GW by 2013 to come from solar farms. Reportedly the minister for energy, Pongsak Ruktapongpaisal, is now considering using rooftop solar to fulfil this quota, should any PV plants not be operational in time for the December cut off, according to The Nation.</p>	PV-Tech

## MARKET NEWS (4/4)

Date	Topic	Source
17/10/2013	<p><a href="#">Conergy: Further order from Thailand</a>            The provider of PV system solutions and services Conergy is building two solar parks for Siam Solar Energy 1 Co.Ltd (SSE1) with a capacity of 10.5 MW each. Since autumn 2012 Conergy has build and completed solar power plants with a capacity of over 70 MW for SEE1. The provider has a market share of 20 % in Thailand due to a contract volume of more than 100 MW.</p>	Ecoreporter
30/05/2013	<p><a href="#">Grace Solar completes 11.7 MW solar power station in Thailand</a>            As the leader of PV mounting system in Southeast Asia, Grace Solar cooperated with world famous EPC company, providing ground mounting system for the Thailand 11.7MW solar PV project.</p>	PV-Magazine
27/05/2013	<p><a href="#">More solar licenses to be revoked</a>            A combined 700 megawatts of approved solar farm operating licenses held by benign license holders will be revoked soon, says an Energy Ministry senior official. The official, who declined to be named, said solar energy licenses covering 3,000 MW have been approved by the ministry for those seeking the government's subsidy through the adder tariff programme since 2008 but only 400 MW are in operation.</p>	Bangkok Post
27/05/2013	<p><a href="#">Thai-based solar developer completes 84 MW PV plant in Lopburi</a>            Thai solar project developer Natural Energy Development Co. has announced the completion of its 84 MW photovoltaic plant in Lopburi, Thailand. Investment in the Lopburi project amounts to more than 10 bn THB (335 m US-dollar) with an expected return of investment within 10 years at 1.3 bn THB annually. The Asian Development Bank granted a long-term loan of 2 bn THB for the first phase of the project.</p>	PV-Magazine

## CONTACT INFORMATION

Category	Name	Website
National Ministry of Energy	Department of Alternative Energy Development and Efficiency (DEDE) Ministry of Energy	<a href="http://www.dede.go.th/dede/">www.dede.go.th/dede/</a>
National Energy Regulator	Energy Regulatory Commission (ERC)	<a href="http://www.erc.or.th/ERCWeb2/EN/Default.aspx">www.erc.or.th/ERCWeb2/EN/Default.aspx</a>
State-owned Utility and Transmission Grid Operator	Electricity Generating Authority of Thailand (EGAT)	<a href="http://www.egat.co.th/en/">www.egat.co.th/en/</a>
Utility and Distribution Grid Operator	Metropolitan Electricity Authority (MEA)	<a href="http://www.mea.or.th/home/index.php?l=en">www.mea.or.th/home/index.php?l=en</a>
Utility and Distribution Grid Operator	Provincial Electricity Authority (PEA)	<a href="http://www.pea.co.th/EN/SitePages/home.aspx">www.pea.co.th/EN/SitePages/home.aspx</a>
Photovoltaic Industry Association	Thai Photovoltaic Industries Association (TPVA)	<a href="http://www.tPVA2012.com/index.php">www.tPVA2012.com/index.php</a>

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