

Unofficial GIZ Translation

of the

**Report of Energy Reform Committee,
National Reform Council**

**Quick Win Proposal for Solar PV
Rooftops for Residential and General
Buildings**

Original legal document:

http://library2.parliament.go.th/giventake/content_nrc2557/d010558-01.pdf

Report of Energy Reform Committee, National Reform Council

Quick Win Proposal for Solar PV Rooftops for Residential and General Buildings

1. Background and Rationale

1.1. Energy Reform

1.1.1. The Energy Reform Committee proposed that the following energy concepts be included in the drafting of the constitution:

- The government must ensure energy security.
- The government must ensure that energy demand is sufficiently met by the supply side.
- The government must establish the energy infrastructure to support future growth.
- The government must support the production and use of renewable energy.
- The government must enable its people and their communities to be the power producers for their self-consumption and sale.
- The government must improve public awareness on energy production and energy efficiency.

1.1.2. To bring about the energy reform, it is imperative that the public is aware that “they can be both the power producers and consumers and energy should be used efficiently.”

1.1.3. Although previous governments have done a fair share in promoting solar power, a considerable part of such support has been given to large-scale solar farm projects invested by private and international corporations.

1.1.4. Solar PV rooftop systems are therefore one of the solutions to energy problems. A PV rooftop system is a power-generating system in which PV modules are mounted on the rooftop or any part of a residential or commercial building or structure or installed as a ground-mounted unit on the residential or commercial premises. A clear advantage is that the system requires little space for installation. The modules also shield the rooftop from heat emitted from solar radiation, hence creating an added value to the rooftop.

1.1.5. The Solar PV Rooftops for Residential and General Buildings project is aimed at enabling the public to generate power for self-consumption and sell an unused amount of power to off takers without any quantity or quota restrictions. This will present new market opportunities and eliminate the resale of power generation licenses. Home and building owners as well as housing and industrial estate operators should then be able to prepare long-term investment plans for the installation of PV rooftop systems.

1.2. Objective

1.2.1. The committee would like to propose the quick win proposal for Solar PV Rooftops for Residential and General Buildings to the National Reform Council to put this proposal forward to the cabinet for their final approval and arrangement.

1.2.2. A PV rooftop system is a power-generating system in which PV modules are mounted on the rooftop or any part of a residential or commercial building or structure or

installed as a ground-mounted unit on the residential or commercial premises. Power generated by the modules is used for offsetting the power distributed by the MEA or PEA for household demand or commercial uses. Therefore, the system owner is able to produce electricity to meet their demand and reduce power demand from the electricity utilities, resulting in savings. An unused amount of electricity generated can be sold to the electricity utilities for distribution to nearby residential and commercial users. In addition to minimizing energy expenses, the system owner may generate income from the sale of surplus electricity generated to the grid, making it an economically sound concept.

1.2.3. Electricity rates should be attractive enough to attract interest and stimulate growth in this sector.

2. Topics of discussion

- 2.1. Applications and production of PV system in Thailand
- 2.2. Strategies for promotion of Solar PV Rooftops for Residential and General Buildings project
- 2.3. Comparison of solar PV rooftop promotion strategies in various countries
- 2.4. Assessment of feasibility, impacts and challenges in promoting solar PV rooftop systems
- 2.5. Proposal for Solar PV Rooftops for Residential and General Buildings
- 2.6. Strategies for pushing forward the proposal with relevant parties, e.g. cabinet

3. Opinions of relevant parties

The National Energy Reform Committee of the National Reform Council has assigned the Sub-committee on Alternative and Renewable Energy and Energy Conservation to carry out a study on the prospects of solar PV rooftops for residential and general buildings and present the findings to the National Energy Reform Committee for feedback and approval.

The Sub-committee on Alternative and Renewable Energy and Energy Conservation has organized a sharing session where relevant parties in the government and business sectors have participated and expressed their opinions. The findings are presented below.

	Organization	Opinions
3.1	Sub-committee on Alternative and Renewable Energy and Energy Conservation	<ul style="list-style-type: none"> • Efforts of previous government to promote the solar energy sector have concentrated on large-scale projects in the form of solar farms primarily invested by major and international corporations. This accounts for 94% of the total market share compared to 6% in the rooftop segment. • Application for power generation license has many restricts, e.g. too short time frame, too small quota, strict quota limit for areas, resulting in the resale of licenses obtained to non-applicants. • The quota for the rooftop segment should be increased to enable better access to this alternative to the general public. There should be no quota limit, license application period or area restriction for PV rooftop systems. However, it is important to ensure that the installed capacity for PV corresponds with the capacity of the electrical grid.

3.2	Thai PV Association (TPVA)	<ul style="list-style-type: none"> • Thai operators in the solar power sector have the technical capacity to meet potentially greater demand from the deregulation of PV rooftop market. • 6 PV module manufacturers currently operate in Thailand, with the total production of 200 MW per year and investment of 5 billion baht. The PV modules manufactured are IEC-certified and exported to international markets.
3.3	Energy Regulatory Commission (ERC)	<ul style="list-style-type: none"> • Solar PV rooftop systems and net metering are already in use in Thailand. Therefore, deregulation of the solar PV rooftop market is feasible under an existing legal framework • The National Energy Policy Committee (NEPC) is to issue a resolution to promote the PV rooftop market and submit it to the cabinet for final approval. Once approved, the ERC is to issue relevant regulations and inform the state electricity utilities of such regulations for their action. It will also be responsible for passing on such information to the public. • Promoting Time of Use (TOU) metering has its advantages as it facilitate energy saving during the daytime.
3.4	Energy Policy and Planning Office (EPPO)	<ul style="list-style-type: none"> • With the deregulation of the PV rooftop market through net-metering, surplus power can be fed to the grid in a grid-connected system. If appropriate buying rates can be determined, it would be financially viable for the state utilities to buy power from small power producers without much financial support should be needed from the government. Therefore, this looks like a promising project.
3.5	Department of Alternative Energy Development and Efficiency (DEDE)	<ul style="list-style-type: none"> • Thailand has great potential for growth in the solar energy sector but market expansion of the rooftop segment and installations are still limited. • On-site power generation from PV rooftop systems can help reduce the load burden of the grid during peak demand and reduce transmission losses. These advantages are in line with the country's energy efficiency policy. Therefore, DEDE is in full support of this project. • Quality and safety standards should be developed to provide a solid foundation for market expansion. • Tax incentives and soft loans should be available in the future to attract additional public investment.
3.6	Electricity Generating Authority of Thailand (EGAT)	<ul style="list-style-type: none"> • Demand and supply-side planning and management should be discussed in more detail. • Installations of PV rooftop systems should be evenly distributed across the country to avoid density in any particular area. • Transmission and distribution lines as well as

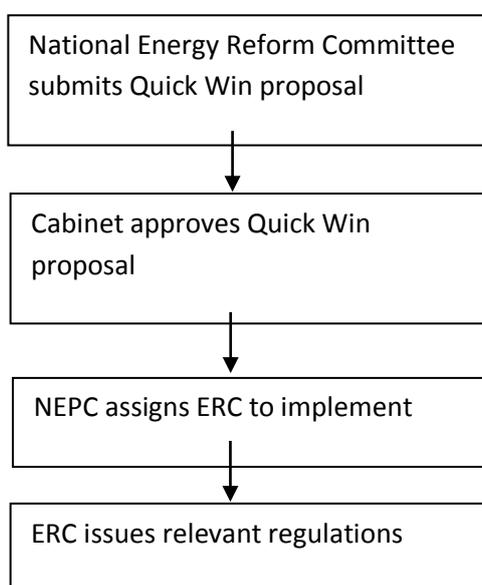
		<p>storage systems should be considered and planned to prevent negative impacts on energy demand and supply and to ensure energy security of the public.</p> <ul style="list-style-type: none"> • EGAT, MEA and PEA plan their power generation based on the PDP. Therefore, relevant details of this project should be included in the PDP for their further arrangement.
3.7	Provincial Electricity Authority (PEA)	<ul style="list-style-type: none"> • PEA is planning to improve and further invest in its grid to accommodate changing demand. In the future, load profiles may differ from now and there may be a need for a storage system. • PEA already has regulations for PV rooftop systems in place and they can be further revised to align with the details of this project. • Electricity rates should be appropriate to attract investment as the current wholesale electricity prices (which PEA uses for buying electricity from EGAT) are too low.
3.8	Metropolitan Electricity Authority (MEA)	<ul style="list-style-type: none"> • MEA is in support of this project and would like to stress the importance of quality standards for PV rooftop system installations and operation. • Bangkok metropolitan is a densely populated areas and the project is expected to gain widespread popularity.
3.9	Advisor to Subcommittee (Asst. Prof. Prasat Meetam)	<ul style="list-style-type: none"> • Germany is very successful in its PV rooftop program. They also have a clean energy act which gives priority to all renewable power producers to feed the power generated to the grid without any quota limit for a period of 20-25 years. Extra cost is borne by consumers. • In its efforts to minimize the use of fossil fuels, the state of Minnesota, USA, has been using PV-generated power to complement traditional power, especially during peak period. As a result, electricity prices have been stable for 25 years and accumulated transmission and generation losses are kept low at 25%. • Deregulation of the PV rooftop market is a practical and achievable approach as much success has already been seen overseas.

3.10 As of 22 October 2014, Ministry of Industry issued a revised ministerial regulation No. 23 stating that installations of solar PV rooftop systems are no longer considered a factory that requires a Ror Ngor 4 Factory Permit and no urban planning restriction is enforced for such installations. This a major change from the previously unfavorable situation where all installations of solar PV rooftop systems on residential and commercial buildings are required to have Ror Ngor 4 Factory Permit.

3.11 The National Energy Reform Committee, the National Reform Council unanimously agreed that the Solar PV Rooftops for Residential and General Buildings project should be submitted as a quick win proposal to the cabinet. Additional comments are, for example:

- One Stop Service Center should be set up to conveniently support the public.
- Antitrust mechanisms should be in place to prevent market control or cartels.
- Tax incentive schemes should be established.
- Knowledge and information dissemination should be carried out to educate the public.
- Educational institutions, together with the Council of Engineers and Engineering Institute of Thailand, should participate in the training, design and inspection of PV rooftop systems.
- PEA and MEA should be responsible for the inspection of the PV rooftop system installation.
- This project will create jobs and income in the PV manufacturing and related industries.

To conclude, the National Energy Reform Committee is confident that this project can be executed immediately under the existing legal framework, without any need to pass or introduce new laws. The process can be depicted in the diagram below.



4. Summary of resolutions of the National Energy Reform Committee

4.1. Targets

System type	Projection period	Total No. of systems	Capacity
Residential <10kW	5 years (2015-2020)	100,000	500 MWp
	20 years	1,000,000	>5,000 MWp
Commercial <500kW	20 years		5,000 MWp

4.2. Strategies and necessary preparation

	Aspect	Necessary preparation
4.2.1	Technical	<ul style="list-style-type: none"> • PEA and MEA should consider investing in transmission lines, smart grid distribution networks and smart metering to ensure integrated networks of power infrastructure to fully serve consumers and areas and ensure energy security in the light of potential expansion of PV rooftops across the country. • One Stop Service Center should be established to provide related services.

4.2.2	Investment	<ul style="list-style-type: none"> • If a home owner who pays 1,000-2,000 baht for a monthly electricity bill installs a PV rooftop system with a capacity of 2kW in an area of 15 m², investment cost should be in the range of 120,000-160,000 baht and monthly savings and income should amount to around 1,200 baht per month. The payback period should be about 8-10 years. • If PV modules are more efficient and prices are more competitive, power producers using PV rooftop systems are likely to generate significant savings and the payback period is likely to be shorter.
4.2.3	Grid safety and stability	<ul style="list-style-type: none"> • Quality of PV modules, inverters and BoS elements must comply with the standards set by the MEA and PEA to ensure safety and grid stability. • Roof structure, mounting systems and installation must be inspected and installers must be trained in accordance with the professional standards of the Council of Engineers and Engineering Institute of Thailand.

4.3. Expected outcomes

	Aspect	Benefits
4.3.1	Economic	<ul style="list-style-type: none"> • Due to economies of scale, installation cost is reduced and the consumer lending market evolves to provide long-term loans to respond to fresh demand, consequently attracting more investment and shorten payback periods. • Solar rooftops will become a new method of saving as PV modules are guaranteed for 25-30 years. • New jobs are created. • On-site power generation and consumption reduces transmission and distribution losses. • PV manufacturing industry will further develop and expand. • If investment in the PV manufacturing and BoS cluster industries, from the upstream sector (e.g. manufacturing of silicon wafer) to the downstream sector (e.g. assembly of PV modules), is supported and promoted by the government as one of the national economic priorities, Thailand could become the hub of the PV industry of ASEAN in the next 10 years.
4.3.2	Energy security and mitigation	<ul style="list-style-type: none"> • Deregulation of the PV rooftop sector is likely to encourage renewable-based power generation, hence reducing dependence on fossil fuels and GHG emissions.
4.3.1	Social equity	<ul style="list-style-type: none"> • On-site power generation for self-consumption and surplus PV power for sale are key driving forces for power decentralization, making it possible for the public to directly meet their own energy demand.

		<ul style="list-style-type: none"> • Power generation will no longer be limited to large corporations but the public and country can become important players and be more self-reliant. • Energy efficiency and conservation should be promoted as a complementary approach to self-sufficiency.
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5. Requests included in proposal for submission to National Reform Council

The National Energy Reform Council is determined to push forward with this quick win proposal as a new year's gift for the general public. Therefore, we would like to seek approval from the National Reform Council and advocate materializing such energy reform without any delay. This can be possible with the cabinet and the NEPC's approval to kick-start the Solar PV Rooftops for Residential and General Buildings project. The underlying terms and conditions for the project are listed below.

- 5.1. The Solar PV Rooftops for Residential and General Buildings project is aimed at enabling the public to generate power for self-consumption and sell an unused amount of power to off takers without any quantity or quota restrictions. This will present new market opportunities and eliminate the resale of power generation licenses to non-applicants. Home and building owners as well as housing and industrial estate operators should then be able to prepare long-term investment plans for the installation of PV rooftop systems.
- 5.2. Ministry of Energy is to work with other relevant agencies, i.e. ERC, MEA, PEA and EGAT to take the following actions:
 - Identify and issue necessary regulations, announcements, criteria and framework to enable owners of residential and general buildings to participate in this project in the most convenient manner without any delay and by any means possible, such as setting a One Stop Service Center.
 - Determine appropriate electricity buying rates for the amount of power offsets from residential and commercial PV rooftop system owners.
 - Disseminate and communicate information about the project to create widespread awareness about this project so that interested parties can take part in this project.
- 5.3. The Solar PV Rooftops for Residential and General Buildings project should be integrated in the PDP (2015-2036) and further investment in the transmission and distribution networks should be appropriately made.
- 5.4. Investment incentives, in particular import and income tax privileges and should be introduced to facilitate prompt, extensive and efficient implementation of the project