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COMMERCIAL & INDUSTRIAL ROOFTOP SOLAR (CIRTS) PROJECT

Boosting the Revival of Viet Nam's Rooftop Solar Market



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CIRTS story & impact



By the end of 2020, Viet Nam witnessed a solar photovoltaic (PV) boom that resulted in the installation of more than 101,000 rooftop solar (RTS) systems totalling 9,296 MWp. This was an important step for renewable energy (RE) development in Viet Nam, but was accompanied by significant challenges, particularly for Viet Nam Electricity (EVN), in managing the national grid and maintaining stable power distribution. This was especially difficult in the central and southern regions, where the deployment of RTS was concentrated.

Since 2021, the GIZ **Energy Support Programme** (ESP), through the **Commercial and Industrial Rooftop Solar** (CIRTS) Project, has worked to improve the conditions for sustainable development of RTS. The focus has been on strengthening CIRTS partners, Viet Nam's Ministry of Industry and Trade (MOIT) and EVN, in the integration of RTS into the electricity grid. Addressing the main technical, administrative and regulatory issues of RTS operation and grid integration helps to provide clean power that is safe and cost-effective for the power system, laying a solid foundation for the further development of clean energy in Viet Nam.

The CIRTS project contributed to technical topics, such as RTS forecasting or remote monitoring and control (M&C), to regulatory issues, such as exports and compensation of surplus electricity from RTS, and to strategic matters, such as change management for the energy transition.

In the wake of the 2020 PV boom, the National Power Development Plan VIII 2021-2030 (PDP8), approved in May 2023, has created opportunities to revive and harness the potential of the rooftop solar market. The GIZ ESP and CIRTS project continue supporting Viet Nam to implement PDP8, with further improvement of the framework conditions for solar energy.

The following impacts show how the Germany-Viet Nam technical cooperation, through the CIRTS project, has driven, and can continue to drive, progress towards a sustainable and dynamic energy future for Viet Nam.

Impact highlights:

Reduced GHG emissions & environmental impact of RTS



- **The electricity output from RTS is optimised, increasing the share of RE in the system**, thanks to the introduction of best practices for operation and maintenance (O&M) and the improvement of EVN's capabilities to manage the grid with high RTS penetration.
- **The environmental impact of RTS is reduced**, by extending the productive lifetime of installations through high quality O&M, by reducing fire and safety risks, and by promoting end-of-life best practices.

Strengthened Viet Nam human resources supporting the solar PV sector



- **EVN leaders are better equipped to manage the energy transition**, building on their learning on innovation and change management.
- **EVN engineers and technicians have better skills and knowledge to manage RTS**, thanks to the specialised training they have received.
- **Students at national vocational colleges can receive up-to-date training** that includes O&M of RTS systems.
- **Vietnamese youth are encouraged to enter the RTS sector** after participating in student forums and job fairs.

Updated policies for solar PV development & integration



- **The RTS market is restarting**, thanks to new policies, including a Decree for export and compensation of RTS surplus power.
- **Clear options contributing to PDP8 targets are available**, by exploiting the potential of solar PV in residential and public buildings.
- **The grid integration of new RTS capacity is facilitated** as RTS systems now require remote M&C functionalities.

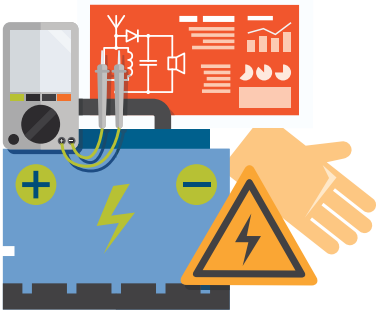
2 Our contributions in detail



Reduced GHG emissions and environmental impact of RTS:

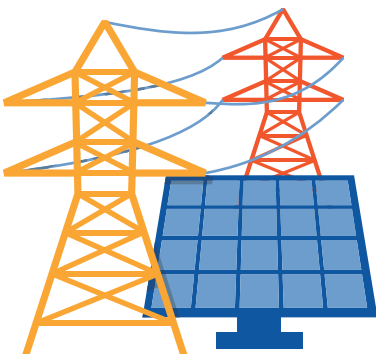
Good practices for RTS installations and well-equipped distribution and transmission operators that can manage high levels of solar power sustain the optimal utilisation of the RTS capacity, increasing the share of RE and reducing greenhouse gas (GHG) emissions.

Improving RTS performance and lifetime with O&M and fire and safety standards



The success of RTS in Viet Nam requires safe and effective installation, operation and maintenance. CIRTS has contributed by raising public awareness, supporting EVN's efforts to promote quality, and fire and safety standards, and developing comprehensive O&M guidelines that help maintain generation performance and increase the lifetime of RTS installations. As a result, RTS stakeholders can generate more value from their systems, increasing profitability and maximising RTS electricity production.

Strengthening EVN's power system coordination & operation



EVN is better equipped to manage existing and future RTS in the electricity system, reducing solar energy curtailment and operating the system cost-effectively. Key achievements include the improved accuracy of solar production forecasting, increased coordination between transmission and distribution system operators (including a memorandum of understanding for data sharing for load and solar forecasting), and the plan to adopt an advanced distributed energy management system (i.e., a DERMS system).

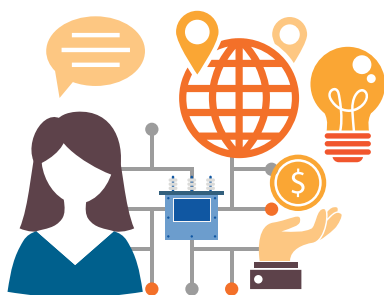
Strengthened Viet Nam human resources supporting the solar PV sector:

Improving access to knowledge for all key players in the solar PV sector is key to ensure effective grid integration and sustainable growth of solar energy in Viet Nam.



Expanding the training curricula for solar PV

Together with Engineering, Procurement and Construction (EPC) contractors, such as Vu Phong Energy Group, CIRTSA developed supplementary materials for the O&M of solar installations. This builds on the success of the training curriculum previously approved by The Ministry of Labour, Invalids and Social Affairs (MOLISA) for the design and installation of solar PV systems, which was jointly initiated by the GIZ Energy and TVET programmes. The materials will be incorporated into the training programmes for technicians of the national vocational colleges.



Capacitating EVN entities to ensure an effective, reliable and secure system operation

CIRTSA organised study tours and delivered specialist training programmes for national and sub-national EVN managers, developed and conducted training for EVN technical staff, facilitating knowledge transfer on the latest solar technologies and grid integration techniques, including smart grid technologies, to increase efficiency and reliability. The trainings also covered quality and safety, maintenance, and operation of RTS systems.



Preparing EVN middle and high-level managers to plan for the energy transition

EVN's middle and high-level managers have been trained on change management and innovation in the context of the energy transition, allowing them to reflect on leadership, human resources and business strategies that will drive them in the next years to meet growing energy needs and net-zero emission targets. Training courses on business models for power system with distributed energy resources were also offered, shedding light on how to transform challenges in opportunities in that new ecosystem.



Increasing awareness on job opportunities & benefits of renewable energy

Jointly with other GIZ energy projects, CIRTSA launched awareness campaigns to inform the young workforce about career opportunities in the RE sector, supporting student forums and job fairs, including competitions for male and female university students. CIRTSA also worked closely with journalists to raise public awareness of the benefits of RE and the energy transition.

Updated policies for solar PV development and integration:

Appropriate policies and regulations that enable to tap into the potential of cost-competitive customer-sited solar power are essential to provide certainty to stakeholders and reactivate the RTS market.



Supporting the restart of the RTS solar market in the context of JETP

CIRTS has supported the restart of the rooftop solar market by providing technical and regulatory advice on RTS policies, including for the export and compensation of surplus RTS electricity. This has been further promoted with other development partners as part of the preparation of the Just Energy Transition Partnership (JETP) Resource Mobilisation Plan.



Promoting the PDP8 targets for PV in residential & public buildings

In response to PDP8 targets, aiming at having 50% of residential and public buildings with a solar installation by 2030, CIRTS and the GIZ Energy Support Programme have contributed with in depth-analysis and tools that show the techno-economic potential of solar PV in these segments, and highlight the opportunities of expanding the technology portfolio for self-consumption to micro-PV.



Updating policies for power system management with distributed RTS


CIRTS reviewed the practices of remote M&C of RTS in Viet Nam and proposed updates in line with international best practices. This contributed to the modifications of the regulatory framework, which now requires the implementation of remote M&C for RTS systems (from 500 kWp systems). Other contributions that are under consideration include the rules for curtailment of RE and the initiation of pilot projects for Distributed Energy Resource Management Systems (or DERMS).

3 Facts & figures

CIRTS at a glance:

Budget €5,000,000	Funding Agency German Federal Ministry for Economic Cooperation and Development (BMZ)
Duration Feb 2021 - Jan 2025	Implementing Agency Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ)
	Political Partner Viet Nam's Ministry of Industry and Trade (MOIT), Electricity and Renewable Energy Authority (EREA)
	Beneficiaries Vietnam Electricity (EVN) and its entities

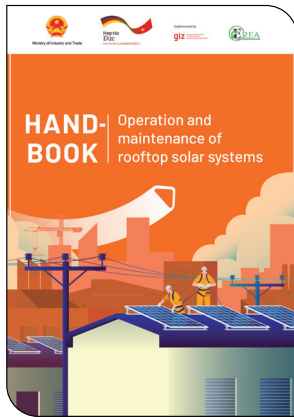
A total of **3,355** participants have improved awareness, knowledge and tools to operate RTS in the Vietnamese power system through:

 **01** **E-LEARNING ON RTS GRID INTERGRATION**
with
63 EVN technical experts

 **13** **TRAINING COURSES**
with
506 participants
(**18%** female)

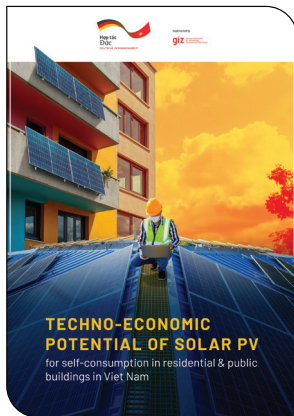
 **20** **TECHNICAL EVENTS**
with
2,786 participants

10 STUDIES providing recommendations on mechanism, administrative and technical to optimise the management and use of RTS and to improve the integration into the power system.



RTS O&M packages

(handbook, maintenance checklist, safe practices, performance ratio calculation tool)



Techno-economic potential of solar PV for self-consumption in residential & public buildings in Viet Nam



Recommendations for remote monitoring & remote control requirements for rooftop solar PV systems in Viet Nam



Framework assessment & action plan for solar PV module waste recycling in Viet Nam



4 Testimonials



"Due to the increasing share of RE in Viet Nam's electricity supply, the TSO-DSO workshops play a crucial role in promoting the efficient operation of electricity systems... contributing to the development and energy transition related to RE, transmission and distribution system operation..."

Mr. Nguyen Ba Hoai,
Deputy Manager, RE Management Department,
National Power System and Market Operator Company / MOIT

"RTS power has developed rapidly in Viet Nam, so the knowledge and experiences shared in trainings provided by the CIRTIS project have helped EVN staff to be more confident and improve their efficiency in operating and managing RTS systems and RE. Additionally, in the context of energy transition and digital transformation, EVN will face many changes. The change management training to high and middle level EVN managers helps them to have a common voice and way of acting, to lead to a successful change."



Ms. Phan Thi Hong Hanh,
Deputy Head of Organization & Human Resource Department, EVN



"Applying international processes and experiences from the O&M packages developed by CIRTIS in collaboration with Vu Phong Energy Group helps standardise process and brings practical value to investors and implementers, helping the system operate stably, minimizing downtime and maintenance costs. Proper application of this process will improve the operational efficiency and prolong the life of solar PV systems, sustainable development of the RE industry in general and rooftop solar power in particular."

Mr. Pham Dang An,
Deputy General Director of Vu Phong Energy Group

5 Outlook



CIRTS engagement in supporting Viet Nam's rooftop solar since 2021 has been instrumental in overcoming the challenges of a stagnant market. As the CIRTS project concludes, the contributions addressing regulatory and technical integration issues, promoting best practices, and empowering stakeholders, have laid a strong foundation for further growth of the solar sector.

Viet Nam's solar power future is promising, fuelled by rising energy demand and a commitment to reducing fossil fuel reliance. However, realizing the significant potential of RTS requires overcoming key policy, technical and human capacity needs.

A comprehensive strategy is needed, focusing firstly on upgrades to grid infrastructure, including strengthening distribution grids to accommodate increased solar power influx, deploying advanced energy storage solutions to manage intermittency and implementing sophisticated DERMS for efficient integration of distributed generation.

Secondly, ensuring stable grid operation, including the adoption of demand-side management programmes to better balance supply and demand and the definition of ancillary services to manage the variability from RE.

Thirdly, integrated power system planning, encompassing coordinated planning for generation, transmission, and distribution to accommodate solar power. This requires sophisticated modelling and forecasting capabilities. Finally, continued capacity building is needed to train and empower technicians, engineers, and policymakers to effectively manage and integrate the increasing share of RE in Viet Nam's energy mix.

Addressing these interconnected challenges will be key to unlocking Viet Nam's solar potential and driving a sustainable energy transition.

The GIZ Energy Support Programme remains committed to accelerating this transition through continued support in policy advocacy, technical assistance and capacity building, fostering collaboration among stakeholders, and ultimately contributing to a cleaner, more sustainable energy future for Viet Nam.

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