

STATE SUPPORT POLICIES FOR SOLAR ENERGY IN VIETNAM'S TEXTILE AND GARMENT INDUSTRY

Nguyen Thi Lan Huong¹, Tran Thi Ngat²

1 Department of Electrical Engineering, Faculty of Mechanical and Electrical Engineering, Hanoi Industrial Textile Garment University, VietNam

2 Department of Business Administration, Faculty of Economics, Hanoi Industrial Textile Garment University, VietNam

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Abstract: This article focuses on government support policies for the installation and use of solar energy in Vietnam's textile and garment sector, highlighting the economic, environmental, and sustainability benefits for businesses. It analyzes current policy frameworks and emphasizes economic advantages such as reducing electricity costs and generating passive income, while also promoting environmental protection and sustainable development. In addition, it addresses challenges regarding investment costs and technology, and proposes strategies to leverage incentives for accelerating the transition to clean energy in the industry.

Keywords: Solar energy, policy, textile enterprises, Vietnam

1. Problem statement

Vietnam has witnessed an annual electricity consumption growth rate of approximately 10–12% over the past decade, according to the Ministry of Industry and Trade (2023). The surge in demand across industrial sectors—particularly textiles—has required constant upgrades to the national grid. However, the electricity supply has not always met demand reliably. During the dry seasons and peak summer months from 2021 to 2023, localized power shortages occurred due to diminished hydroelectric capacity and limited operation of coal-fired power plants.

Power outages and scheduled electricity restrictions have repeatedly disrupted textile manufacturing operations. Interruptions have halted production lines, delayed order delivery, and increased maintenance costs. Sudden blackouts have led to raw material loss and compromised product quality. At the same time, the rising costs of fuel inputs, electricity generation, transmission, and taxes have driven up electricity prices. According to EVN, the average retail price of electricity has increased by around 7–8% over the last three years.

As one of the largest electricity-consuming sectors, textile enterprises have been significantly affected by soaring electricity costs. A 2023 industry report by the Vietnam Textile and Apparel Association (VITAS) notes that energy accounts for 12–15% of total production expenses in the textile sector. These rising energy costs compel businesses to invest in energy-saving equipment or shift to renewable sources to remain competitive.

The textile industry accounts for roughly 15–20% of electricity consumption within Vietnam's manufacturing sector, consuming an estimated 2–3 billion kWh per year, depending on factory scale and quantity. It emits approximately 5 million tons of CO₂ annually—ranking third after the cement and steel sectors in terms of environmental impact. Electricity powers weaving machines, dyeing lines, treatment systems, and other production equipment. Energy can make up 20–30% of total production costs, placing enormous pressure on firms competing with rivals from China, Bangladesh, and India, where electricity prices and consumption levels are often lower.

To cope with energy-related costs and quality, many enterprises have invested in automation systems and modern machinery to enhance efficiency and reduce consumption. By cutting energy costs by 15–25%, businesses can

improve profit margins and strengthen global competitiveness. Moreover, dependency on an unstable grid has made it difficult for factories to maintain continuous operations, especially during peak demand or power shortage periods.

One notable example is Thành Công Textile and Garment Factory in Vĩnh Long, which installed a rooftop solar system generating 48.5 million kWh-meeting 66% of its energy needs-saving \$1.9 million and reducing CO₂ emissions by over 4,200 tons. Solutions such as rooftop solar, wind turbines, bioenergy, and waste heat recovery are increasingly encouraged to cut costs and enhance sustainability. With an average solar irradiance of 4–5 kWh/m²/day, Vietnam holds strong potential for solar energy development.

Reducing electricity expenses by 15–25% through solar installations and energy-efficient technologies could help the industry save up to \$1 billion annually-significantly boosting its global competitiveness.

2. Current status of solar energy support policies in Vietnam's textile and garment sector

In recent years, Vietnam has made significant progress in promoting solar energy, with the government introducing a range of support mechanisms, including Feed-in Tariff (FIT) schemes, tax incentives, preferential loans, and technical assistance for solar energy businesses.

The FIT policy for solar power was formalized under Decision No. 13/2020/QĐ-TTg (April 2020), establishing a framework to promote solar energy development. The FIT applied to grid-connected solar projects with power purchase agreements signed between July 1, 2019, and December 31, 2020. Both ground-mounted and rooftop solar systems qualified for a rate of 1,943 VND/kWh (approximately 8.38 US cents/kWh), guaranteed for 20 years from the project's commercial operation date. This favorable rate successfully encouraged large-scale corporate investment in solar energy.

Regarding tax incentives, enterprises investing in renewable energy projects, including solar power, are entitled to a reduced corporate income tax rate of 10% for 15 years, or full exemption for 4 years followed by a 50% reduction for the next 9 years, under the amended Corporate Income Tax Law (2016, revised 2019). Additionally, import duties are waived for machinery, equipment, and components used in solar technology production. VAT exemptions or reductions apply to relevant services involved in solar investment.

In terms of financial support, state-owned commercial banks collaborate with the Ministry of Industry and Trade and the Vietnam Renewable Energy Development Fund (VREF) to offer concessional loans, typically at interest rates of 6–8% per year. Some loan programs offer further reductions for businesses meeting “green” or sustainable criteria, or those participating in technical support schemes. For example, MB Bank provides 1–2% lower interest rates for clean energy projects. Enterprises in the textile sector may also receive support when pursuing international certifications such as GlobalG.A.P., WRAP, or ISO standards.

To qualify for concessional “green finance,” businesses generally need to meet several criteria, including: Commitment to and implementation of recognized sustainability standards such as ISO 14001 or EMAS; Use of eco-friendly, recycled, or waste-reducing raw materials; Adoption of renewable energy sources, clean technologies, or high-efficiency systems; Publication of sustainability or ESG reports; Participation in technical training programs and process improvements; Achievement of certifications such as LEED, FSC, or WRAP; Clear plans and targets related to emission reduction, energy conservation, and environmental compliance.

Green credit policies are guided by documents such as Circular No. 39/2016/TT-NHNN on environmentally friendly lending in production and services. While the exact interest rate reductions may vary across financial institutions and over time, they typically range from 0.5% to 2% lower than standard rates. International organizations like the World Bank and other global financial institutions also support green enterprise development through specialized credit programs and technical assistance. Major Vietnamese banks-including Vietcombank, MB, BIDV, and Agribank-have launched preferential green loan products tailored to sustainable business investments.

On the technical support front, the government-through the Ministry of Industry and Trade, energy research institutes, and clean energy consulting centers-offers training programs, workshops, and technical guidance either free of charge or at subsidized costs. These include system design, performance evaluation, maintenance, and operations training. Specialized training for the textile sector helps enterprises understand solar energy applications, enhance system efficiency, and strengthen self-reliant operations and maintenance capacity.

Support is available from institutions such as the Renewable Energy Development Consulting Center (under the Ministry of Industry and Trade), the Vietnam Energy Institute, and other authorized consultancy agencies. They offer tailored guidance on selecting appropriate technology based on factory type and scale, assessing economic and environmental performance, navigating regulatory procedures, and grid integration. Short-term courses on solar design, installation, safety, and risk management are also offered both on-site and through national renewable energy centers. International organizations and private energy firms regularly coordinate to provide updated and practical training sessions.

These government policies have generated tangible benefits for textile enterprises: equipping them with essential solar energy knowledge, facilitating sound investment decisions, optimizing system performance, reducing operating costs, and extending system lifespan. Enterprises gain greater autonomy in system management and maintenance, reduce external contractor dependence, and fulfill safety and environmental standards. Moreover, the solar transition enhances corporate reputation, attracts environmentally conscious clients and partners, and aligns with Vietnam's broader sustainable development goals.

By reducing electricity costs and increasing profitability through surplus power sales, solar energy adoption contributes to lower greenhouse gas emissions and improved corporate social responsibility. Thus, textile businesses are encouraged to proactively adopt solar technologies and leverage state incentives to overcome investment challenges. These policies not only strengthen enterprise competitiveness but also contribute meaningfully to national sustainability targets.

3. Challenges and solutions

Although Vietnam's solar energy support policies have achieved significant progress, they still face major challenges-namely high initial investment costs, technological constraints, infrastructural limitations, and policy inconsistency.

High initial investment costs remain one of the primary barriers. Installing solar rooftop or solar farm systems requires substantial capital, typically ranging from 15 to 25 million VND per kWp. For a textile factory with high energy consumption-for example, 500 kWp capacity-the cost of equipment and installation alone can reach 7.5 to 12.5 billion VND. Additional expenses include system design, construction, grid connection, and ongoing maintenance.

Technological challenges are also evident. The textile industry relies heavily on stable, uninterrupted electricity for energy-intensive machinery. However, solar power systems are weather-dependent, thus requiring storage or backup power solutions to ensure supply reliability. Efficient operation depends on optimized solar panels, inverters, and monitoring systems, which demand technical expertise. Enterprises often need to build in-house capacity or collaborate with specialized service providers for system operation and maintenance.

Infrastructure constraints further complicate adoption. Existing facilities may require upgrades to integrate solar systems-such as establishing two-way metering and ensuring grid compatibility. In some regions, local grid infrastructure may be underdeveloped or lack supportive policy frameworks to absorb solar-generated electricity. Moreover, the permitting and licensing processes for grid connection can be bureaucratically complex and time-consuming.

To address these obstacles, several key policy and practical solutions have been proposed:

Introduce a transparent and flexible electricity pricing mechanism: Transitioning from fixed FIT schemes to competitive bidding or time-of-use pricing would better reflect market value and incentivize efficiency.

Invest in grid modernization and smart infrastructure: Upgrading transmission and distribution systems, along with implementing smart grid technology, would enhance the capacity to integrate renewable sources like solar energy.

Promote energy storage systems: Tax incentives, preferential financing, and technical assistance should be offered to projects involving battery storage-particularly in areas prone to power curtailment.

Streamline administrative procedures and improve financial access: Establishing a one-stop mechanism for rooftop solar projects and expanding green credit programmes would reduce bureaucratic delays and improve investment viability for SMEs.

Maximize policy incentives and foster partnerships: Enterprises are encouraged to proactively explore government support programmes, secure green financing, and engage with technology partners to accelerate the transition toward clean energy.

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