Енергетичне Партнерство
Energy Partnership
Ukraine – Germany

UKRAINE SOLAR ENERGY MARKET ANALYSIS

Ukraine possesses **significant potential for renewable energy, particularly solar photovoltaic (PV)** and wind power. Since the beginning of the full-scale Russian invasion and targeted attacks on the energy sector, decentralised solar energy and residential solar panel installation securing the electricity supply have contributed greatly to energy resilience. Solar energy is also key to rebuilding Ukraine's energy supply in the short term thanks to its ability to be deployed relatively easily, cheaply and quickly. Taking into account market projections, the strategic focus on decentralised energy and alignment with European Union (EU) standards, the long-term outlook is promising if Ukraine develops the flexibility and effective market signals to further integrate renewables and reach its national targets.

Market Overview & Growth Trends (2020–2024)

Ukraine saw an unprecedented boom in its renewable energy industry between 2009 and 2019, after the introduction of a very high green feed-in-tariff (FiT) in 2008. In 2019 alone, solar energy capacity tripled to 6 GW [1] and reached a total installed capacity of 8.06 GW by early 2022,[2] having attracted over €8 billion in investment. The FiT set by the government and paid by the state-owned company Guaranteed Buyer (GB) was one of the highest in Europe, making Ukraine attractive for foreign investors, but it was unsustainable for the market in the long term. The solar boom stalled in 2020 and 2021 as the GB accumulated debts and a backlog of payments to renewable energy producers. Although the FiT was retroactively reduced in 2020, it remains legally valid until the end of 2029. It is still possible, for instance, for private households to apply for the green tariff for domestic PV installations. These changes paved the way for more market-oriented mechanisms, notably net billing for consumers, a feed-in premium, an auctions model and the possibility of bilateral contracts between energy producers and consumers.

Since the full-scale invasion began in February 2022, Ukraine's energy sector has been a **major target of attacks.** Approximately **30% of all solar PV capacity has been affected**[3] as of mid-2024, much of which is temporarily unavailable because it is located in occupied areas or its status is unknown. Due to massive losses and damage to centralised fossil fuel-based electricity generation and the destruction of the Kakhovka Dam – exacerbated by the occupation of the Zaporizhzhia nuclear power plant and thermal power plants – small-scale solar panels proved to be a fast and cost-optimal solution to fill the supply gap, especially at the local level, along with interim measures, such as diesel generators. In addition, electricity imports from the EU have significantly contributed to easing energy shortages during critical periods. In the past year alone, Ukraine added 800 MW of solar energy to its grid,[4] and there are many new projects and funding programmes under way. As of February 2025, around 7 GW of renewable energy capacity is operational – the vast majority solar – providing up to 15% to 20% of electricity in sunny daytime hours.[5]

This development has been driven by **local initiatives and municipalities** as well as by decarbonisation and climate targets required as part of the EU accession process and milestones related to disbursements from the EU Ukraine Facility. While many municipal initiatives rely on grant support, others offer interesting cooperation arrangements or guaranteed payments.

Civil society is also very active in Ukraine's decentralised solar development, both in terms of securing funds from private donors and coordinating larger-scale donor projects, including financing. These projects are usually for hybrid solar power plants and battery storage systems for local infrastructure, such as hospitals and schools.

International funds and loans have also gone towards financing solar projects for critical public infrastructure, such as hospitals, schools and municipal facilities. The Ray of Hope initiative, managed by the Energy Community, has completed numerous projects and has a further nine tenders currently open for bids from companies as of May 2025.[6] The German Federal Ministry for Economic Affairs and Energy (BMWE) provides grant money, via the European Investment Bank (EIB), for renewable energy projects in municipalities and just transition regions.

Industrial and residential installations[7] by private entities have also been driving solar energy projects. Several Ukrainian digital marketplaces, such as Eco Tech Ukraine, offer a broad range of installation services, solar panels ranging from 20 kWh to 500 kWh and more.[8]

Most solar panels and related equipment are imported from China or donated, as there are very few producers of such items in Ukraine.[9] In 2018, import duties on solar panels were removed, and in July 2024 this was temporarily extended to some other equipment, all of which are now exempt from value added tax (VAT) until the end of 2025.

2025 Outlook & Expansion Potential

Critical shortages are driving demand in Ukraine for decentralised energy generation and system resilience, but rollout is currently too slow-paced for Ukraine's National Energy and Climate Plan targets to be reached by 2030.

Most of the hydropower plants and coal-fired and other thermal power plants that provided **nearly half of Ukraine's** electricity generation **have been damaged or destroyed.** Ukraine continues to face **a significant electricity deficit,** which is expected to reach 2 GW to 6 GW during peak demand if nuclear generation and import capacities remain stable. Power shortages are anticipated not only in winter but also in the summer months.

In June 2024, Ukraine published its National Energy and Climate Plan,[10] which sets targets for the energy sector through to 2030. It aims to increase the share of renewables in final energy consumption to 27%. The National Renewable Energy Action Plan sets a target of 12.2 GW installed solar energy capacity by 2030 to achieve this goal, which will require a ramp-up in deployment.

Based on Ukraine's geographic potential for solar generation, studies estimate that, theoretically, up to 80 GW of solar capacity could be installed, provided that the necessary grid stability improvements, policies and investments are implemented.[11]

Electricity Market Design & Regulatory Challenges

Despite being partially liberalised, Ukraine's electricity market remains highly regulated. Consumer price controls, cross-subsidisation, inefficient tariffs and other regulations have distorted market dynamics.[12] Renewable energy policy has been slowly adapting since the first boom in renewables, but Ukraine is still far from a fully liquid energy market. The newly introduced auction mechanism has not yet been successful, and the auction held in March 2025 for 33 MW solar failed to attract bidders. The GB still has a backlog of outstanding payments to renewable energy producers, although payment times have been improving and a roadmap to enhance financial sustainability is being implemented. The need to increase electricity system flexibility, particularly at the distribution level, is another main bottleneck for further large-scale deployment of small decentralised renewable energy systems.

The critical need for decentralised electricity has led to the streamlining of the permitting process under martial law and an increase in local support for renewables, although delays due to complex procedures are still common, particularly at the municipal level. In June 2024,[13] a new law was adopted that redistributes powers among central executive authorities, with a clear focus on reducing bureaucratic obstacles. The law specifies the authorities responsible for local energy plans. This redistribution of powers will hopefully avoid any duplication of functions and reduce bureaucratic barriers, increasing management efficiency and expediting project approval. New legislation improving the regulatory framework continues to be introduced. Recent amendments in January 2025, for example, provide more opportunities for municipalities to promote and incentivise local electricity production.[14]

For further in-depth analysis of the Ukrainian solar energy market and its regulatory challenges, see the following reports:

- A Solar Marshall Plan for Ukraine – Greenpeace
- Renewable Energy in Ukraine – DIW Econ
- Empowering Ukraine Through a Decentralised Electricity System – IEA

Market Risks & Mitigation Strategies

Despite wartime uncertainties and the physical risk, in some regions, of damage from Russian attacks, solar energy projects are generally economically interesting for a variety of actors from households to companies and municipalities. They may, in combination with battery storage, ensure a more stable electricity supply in a tight electricity market and therefore continue to attract local and foreign investors.

Efforts are being made to further **improve investment conditions and reduce capital costs** through mechanisms for attracting private investment and effective lending. Existing government loan programmes, such as Affordable Loans 5–7–9%, provide enterprises and individual entrepreneurs (resident in Ukraine) with subsidised loans for local investment.[15] The European Bank for Reconstruction and Development (EBRD) has allocated €600 million to the energy sector, and its Energy Security Support Facility (ESSF)[16] offers loans through local banks to entrepreneurs and small to medium-sized businesses registered in Ukraine.

Additional funds are granted to help international investors mitigate war-related uncertainties through guarantees and war risk insurance schemes. About €9.3 billion in guarantees and grants has been made available by the EU Ukraine Facility's investment arm to support investment projects in Ukraine.[17] Calls for proposals for larger projects are published regularly. These funds are channelled via international and bilateral financial institutions, including the EIB, the EBRD, the International Finance Corporation (IFC) and KfW. Several European development finance institutions have also applied for guarantees under the Ukraine Investment Framework, which is expected to broaden the pool of potential financiers for renewable energy investments.

Public support for renewable energy investments by the international private sector in Ukraine is further provided in the form of investment and export credit guarantees by the German Government (via Euler Hermes and PricewaterhouseCoopers), the Export and Investment Fund of Denmark (EIFO), the Polish Export Credit Agency (KUKE) and the World Bank.

The EBRD offers some sort of war risk insurance for transport. There is a limited pool of institutions – mainly development and international financial institutions – able to offer long-term, non-recourse financing for solar projects in Ukraine under economically viable terms.

Project Development Steps & Announced Projects

Solar parks have been widely established in Ukraine, and many local companies offer full project implementation from planning to installation. Solar power plants can be completed within a six to twelve-month timeframe. **Larger solar power projects may take longer to secure full land permitting and financing, depending on their technical complexity.**

GOLDBECK SOLAR Investment Ukraine is one of the largest German companies to enter Ukraine's solar market so far, backed partially by a loan from DEG under the German ImpactConnect programme. To be eligible for funding under this programme, European investors must have a subsidiary operating in the country and successful projects under their belt.[18] There are also local investment opportunities that do not require a local subsidiary, for example, open tenders issued by Zhytomyr's city council for the construction of several medium-sized solar plants, including two floating solar plants on reservoirs in the region.[19] Ukrainian solar company Unisolar recently published its business case analysis of a small rooftop solar installation for a business. The Unisolar team calculated the amortisation period for a 200 kW AC/259.2 kW DC rooftop solar power plant. Installing batteries would have raised the initial investment costs by 71% and increased the payback time to 5.8 years, so the company decided not to install batteries and acquired the status of active consumer to sell excess energy back to the grid. The project would then have a payback time of 3.57 years and bring in additional income of approximately €40.600 a year.[20]

A selection of ongoing projects with different types of investment are shown below.

Examples of Ongoing Solar Project Investments in Ukraine

Company	Type of investment	Finance institution / company	Ukrainian partner / offtaker	Planned Completion	Link to project information
GOLDBECK SOLAR Investment Ukraine and EBRD	Equity deal [21] (EBRD) and loan	Loan from DEG (through the ImpactConnect programme)	Equity joint venture (GOLDBECK SOLAR Investment and EBRD)	Portfolio of 500 MWp	GOLDBECK SOLAR Investment Ukraine
A. Reiter GmbH	Energy supply for own production	Equity and grant from develoPPP programme	Ukrainian subsidiary	600 MWh a year	DEG press release
Unisolar	Greenfield infrastructure investment	Private business	Private business	200 kWp rooftop solar	Unisolar case analysis

Company	Type of investment	Finance institution / company	Ukrainian partner / offtaker	Planned Completion	Link to project information
Elementum Energy	Brownfield investment	Modus Energy International B.V.	Zhytomyr Solar Farm	33 MWp	Zhytomyr Solar Farm – Electrum
Open tenders/ DREAM Ukraine	Greenfield investment	Partially publicly funded (municipality of Chernihiv)	Municipality of Chernihiv	200 kW	Ground-mounted solar
Open tenders	Greenfield investment	Private investors	Municipality of Zhytomyr	Floating solar power plant with a capacity of 40 MW	Construction of a Floating Solar Power Plant

For further business-related questions, please feel free to reach out to the German Chamber of Commerce in Kyiv – contact person Andrii Chubyk: andrii.chubyk@ukraine.ahk.de.

[1] M. Rudolf, V. Bondaruk and K. C. Crone (2021). Green Hydrogen in Ukraine: Taking Stock and Outlining Pathways. Deutsche Energie-Agentur GmbH (dena). https://energypartnership-ukraine.org/fileadmin/ukraine/media_elements/Green_Hydrogen_in_Ukraine.pdf

[2] DIW Econ (2024). Renewable energy in Ukraine: Current institutional environment, investment barriers and prospects. GIZ-Project: Supporting Structural Change in Ukrainian Coal Regions. Work Package 1/C – Report. https://diw-econ.de/wp-content/uploads/JT_UA_DIW-Econ-Report_RES-in-Ukraine_v.1.0.pdf

[3] P. Bilek, R. Stubbe and H. Wesner (7 June 2024). A Solar Marshall Plan for Ukraine – Empowering Ukraine's brighter future: bottlenecks and key policy reforms needed to boost solar PV deployment. Greenpeace e.V.

[4] P. Jowett (13 January 2025). 'Ukraine adds over 800 MW of solar in 2024'. pv magazine International. https://www.pv-magazine.com/2025/01/13/ukraine-adds-over-800-mw-of-solar-in-2024/

[5] DiXi Group (2024). 'Passing through the autumn–winter period: Energy system status 2024–2025'. https://dixigroup.org/en/analytic/passing-through-the-autumn-winter-period-energy-system-status-2024-2025/

[6] Digital Restoration Ecosystem for Accountable Management (DREAM Ukraine) (2022). 'Construction of a solar power plant'. https://dream.gov.ua/project/DREAM-UA-010824-13258E94/profile?fromFilter%5Blocation%5D=UA74100390000073425%2CUA23020150000063371

[7] SonceUkraini (27 December 2024). Новая солнечная станция 70 кВт для предприятия. https://www.youtube.com/shorts/DySKEYJNxLk

[8] Eco Tech Ukraine (2021). Промислова сонячна електростанція 1 МВт під зелений тариф. https://eco-tech.com.ua/ua/g11805446-promyshlennye-solnechnye-elektrostantsii

[9] GIZ (2024). Snapshot: Ukrainian Renewables Market. https://energypartnership-ukraine.org/fileadmin/ukraine/media_elements/250131_Snapshot_Renewables_Market_Ukraine.pdf

[10] Energy Community (2025). National Energy and Climate Plan of Ukraine 2025–2030.

[11] GIZ (2024). Snapshot: Ukrainian Renewables Market. https://energypartnership-ukraine.org/fileadmin/ukraine/media_elements/250131_Snapshot_Renewables_Market_Ukraine.pdf

[12] C. Hart, T. Vatman and T. Gebhardt (2024). Empowering Ukraine Through a Decentralised Electricity System: A roadmap for Ukraine's increased use of distributed energy resources towards 2030. International Energy Agency (IEA). https://www.iea.org/reports/empowering-ukraine-through-a-decentralised-electricity-system

[13] Parliament of Ukraine (2024). Про внесення змін до деяких законів України щодо врегулювання повноважень центральних органів виконавчої влади у сфері забезпечення енергетичної ефективності. Офіційний вебпортал парламенту України. https://zakon.rada.gov.ua/laws/show/3764-20#Text

[14] Dentons (2025). 'Ukrainian parliament approves revolutionary law changing grid connection of renewables and certain other related key rules'. https://www.dentons.com/en/insights/articles/2025/january/29/ukrainian-parliament-approves-revolutionary-law-changing-grid-connection-of-renewables

[15] Business Development Fund (n.d.). 'Program "Affordable Credits 5–7–9%"'. https://bdf.gov.ua/en/programs/program-affordable-credits-5-7-9/

[16] EBRD (2025). 'Energy Security Support Facility (ESSF) in Ukraine'. https://www.ebrd.com/essf-ukraine

[17] German Economic Team (2024). 'The EU launched calls for investments under the Ukraine Facility'. https://www.german-economic-team.com/en/newsletter/the-eu-launched-calls-for-investments-under-the-ukraine-facility/

[18] DEG – Deutsche Investitions- und Entwicklungsgesellschaft (2019). 'ImpactConnect'. https://www.deginvest.de/Unsere-L%C3%B6sungen/ImpactConnect/index-2.html

[19] Investment Portal of Zhytomyr (14 November 2023). 'Construction of a Floating Solar Power Plant'. https://investinzhytomyr.com/en/investment-offers/construction-of-a-floating-solar-power-plant/

[20] Unisolar (28 April 2025). Unisolar – LinkedIn Case Report. https://www.linkedin.com/feed/update/urn:li:activity:7322551832659001344/

[21] The EBRD's first equity deal in Ukraine's energy sector since the full-scale invasion.

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