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POWERING A JUST
ENERGY TRANSITION IN EGYPT:

POLICY PATHWAYS FOR SCALING DECENTRALIZED RENEWABLE ENERGY

Ahmed Elseidi
Board Chair, Egyptian Foundation for Environmental Rights
National Representative of the Egyptian Energy Justice Coalition

The American University in Cairo
School of Global Affairs and Public Policy

PATHWAYS مسارات
لما بعد النيوليبرالية: أصوات من الشرق الأوسط وشمال إفريقيا
Beyond Neoliberalism: Voices from MENA

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EXECUTIVE SUMMARY

Egypt's energy sector is facing mounting economic and strategic pressure. The country's growing dependence on imported natural gas for electricity generation exposes public finances and energy supplies to volatile prices, regional instability and supply disruption. At the same time, the gradual reform of electricity subsidies risks increasing pressure on households, farmers and small producers already facing rising living and production costs. Egypt has responded by expanding renewable energy and committing to increase its share in electricity generation; however, implementation has remained concentrated primarily in large, utility-scale projects.

Decentralized renewable energy (DRE), including rooftop solar photovoltaics, solar-powered irrigation, community-scale systems and renewable energy installations serving small businesses, can complement utility-scale investment and accelerate Egypt's transition away from fossil fuel dependence. DRE should therefore be understood not simply as an additional source of renewable electricity, but as an essential component of a just energy transition:

one that expands affordable access to clean energy, strengthens energy sovereignty, protects vulnerable groups from rising costs and ensures that the economic and social benefits of the transition reach farmers, households, small producers and local communities.



This policy paper builds on the findings of the multi-stakeholder roundtable convened on 11 February 2026[1] by Greenpeace Middle East and North Africa, the Pathways Beyond Neoliberalism program at the American University in Cairo and the Social and Cooperative Economy Network MENA (SCEN MENA). The roundtable brought together representatives of government institutions and parliamentary bodies, researchers, legal experts, civil society organizations and smallholder farmers. Participants identified DRE as a practical pathway for reducing exposure to volatile fossil fuel prices, strengthening local economic resilience and connecting national climate and energy policies with everyday needs. They also highlighted persistent barriers, including high upfront costs, limited access to concessional finance, complex grid-connection procedures, institutional fragmentation, inadequate information and advisory support, and insufficient recognition of cooperative and community-based energy models.

The paper reviews Egypt's legal, regulatory and policy framework for DRE. This framework is grounded in the Egyptian Constitution and supported by Law No. 203 of 2014 on Stimulating Electricity Production from Renewable Energy Sources, Electricity Law No. 87 of 2015 and successive regulatory circulars issued by the Egyptian Electric Utility and Consumer Protection Regulatory Agency. Recent reforms have introduced binding approval timelines, removed certain grid-integration fees, established rules for battery energy storage systems, and introduced local-content and maintenance requirements.

[1]For more information about the roundtable and its findings, please consult the roundtable report: https://www.greenpeace.org/mena/en/roundtable-report/

Despite this progress, there remains a substantial gap between policy design and implementation. Current regulations do not provide the long-term predictability needed by households, farmers, developers and financial institutions. High borrowing costs and short loan tenures restrict access to DRE, while subsidized electricity tariffs can make investment financially unviable for many consumers. Rural grid constraints and opaque grid-capacity decisions create further uncertainty. These barriers are not only technical or financial; they determine who can participate in the energy transition, who benefits from it and whether the transition reduces or reinforces existing inequalities.

Drawing on international experience from Germany, France, Pakistan and Australia, the paper identifies several conditions for successful DRE expansion: stable and predictable remuneration arrangements; long-term contractual certainty; transparent and gradual changes to incentive schemes; dedicated renewable energy targets; concessional finance; support for battery storage and self-consumption; and targeted measures that enable participation of lower-income groups.

To translate these lessons into an equitable and implementable national approach, this paper recommends action across five mutually reinforcing areas:

1 **Access to Finance and Incentives:** Establish dedicated concessional financing for both off-grid solar irrigation and on-grid distributed solar. This should include longer loan tenures, flexible repayment schedules reflecting seasonal agricultural income, lower equity requirements and government-backed credit guarantees. Grants and targeted public support should complement loans for low-income households and underserved communities. Part of the fiscal savings from subsidy reform should be redirected towards expanding equitable access to DRE, while future incentives should also support battery storage and self-consumption.

2 **Regulatory and Policy Frameworks:** Introduce fixed seven-year net-metering contracts to provide users and investors with greater certainty, protect existing users from retrospective changes and review future adjustments transparently at regular six-month intervals. Electricity subsidy reform should be progressive, beginning with high-income and high-consumption users while maintaining affordability protections for vulnerable households. Egypt should also adopt measurable sub-targets for rooftop solar and solar-powered irrigation within its national energy strategies and future NDCs, publish transparent information on local grid capacity and saturation, and establish clear operational requirements and enforcement timelines for electricity distribution companies.

3 **Market Development and Supply Chain Support:** Develop publicly accessible maps identifying agricultural areas already using, or suitable for, modern irrigation and solar pumping systems. Egypt should also update building regulations to require suitable unobstructed roof space for solar installations in residential, commercial and industrial buildings. Clear DRE sub-targets would provide the market certainty needed by users, suppliers, developers and financial institutions, while appropriate construction standards would help prepare buildings for future solar deployment.

4 **Awareness, Civil Society Participation and Equitable Access:** Strengthen the meaningful participation of civil society and energy users in solar energy decision-making. Agricultural cooperatives, Water Users Associations and other community structures should be supported to organize users, improve access to finance and strengthen community energy governance. Government institutions, banks and civil society organizations should expand awareness and technical advisory programs, particularly for farmers and small producers. Semi-decentralized solar systems should also be expanded in social housing and rural communities to cover shared loads, improve energy resilience and ensure that those unable to install individual systems can still benefit from the transition.

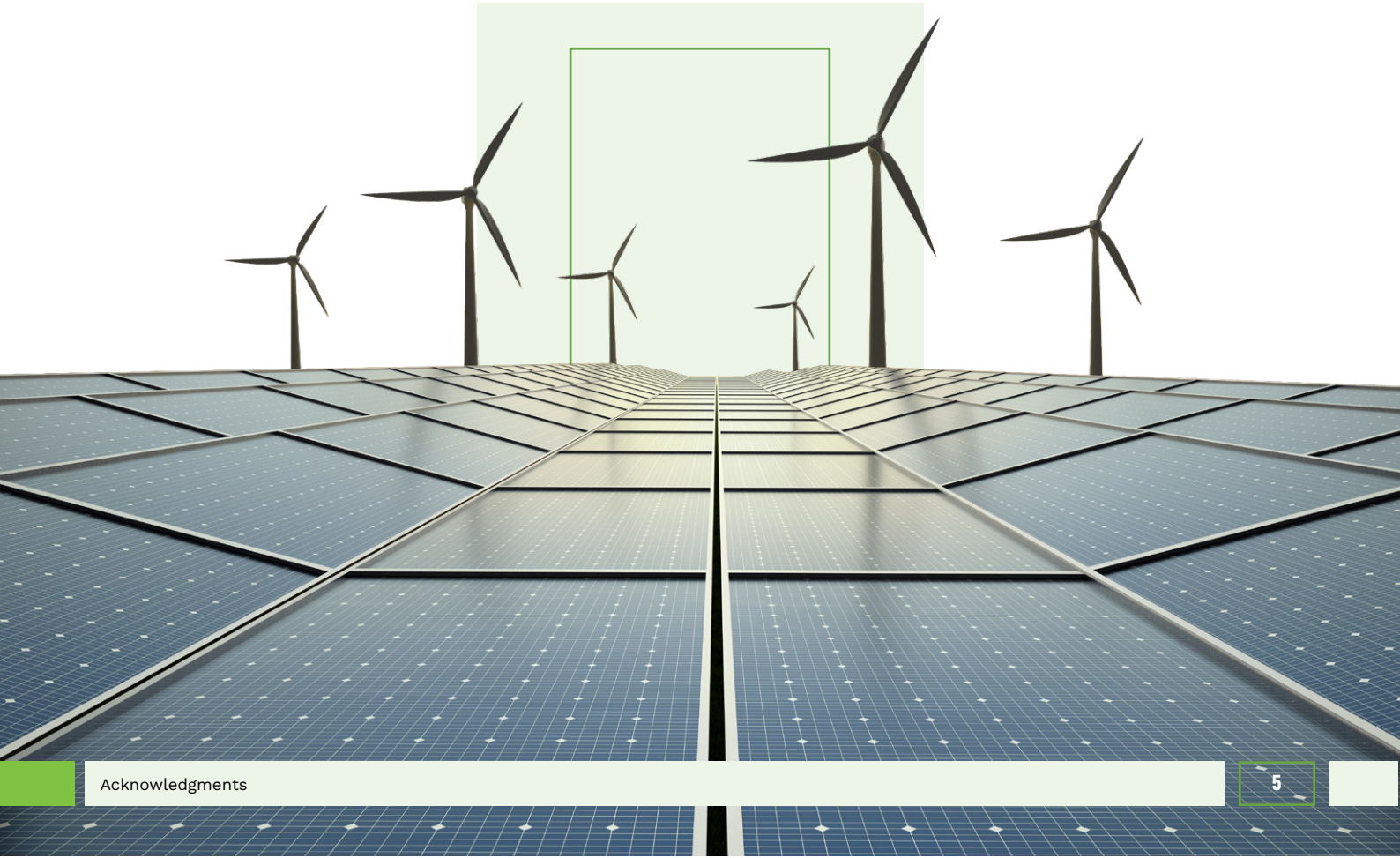
2 **Grid Operation and Stability:** Invest substantially in grid reinforcement, modernization and storage, supported by concessional international climate finance where necessary. Microgrids should be considered where extending or upgrading the conventional grid is impractical, particularly in remote desert areas. The fixed component of electricity bills could be adjusted progressively for high-consumption users to help distribution companies recover grid-maintenance costs. Greater institutional coordination is also needed to ensure the electricity sector shares in the fiscal benefits generated when increased DRE deployment reduces Egypt's natural gas import bill.

Taken together, these measures would position DRE as a core pillar of Egypt's national energy strategy and a practical vehicle for a just energy transition. Scaling DRE will reduce fossil fuel import dependence, improve resilience to energy shocks, support livelihoods and local economic development, and ensure the transition is shaped around the needs and participation of the communities it is intended to serve.

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This paper builds on the multi-stakeholder roundtable on decentralized renewable energy, convened on 11 February 2026 at the American University in Cairo. We are deeply grateful to all participants for sharing their knowledge, experience and perspectives. Their contributions, spanning government institutions and parliamentary bodies, legal and policy expertise, academia and research, civil society and smallholder farming communities, provided an invaluable foundation for this paper and helped ensure that its recommendations respond both to policy priorities and to realities on the ground.



ACRONYMS

AUD	Australian Dollar
ABE	Agricultural Bank of Egypt
BESS	Battery Energy Storage Systems
CBE	Central Bank of Egypt
DRE	Decentralized Renewable Energy
EEHC	Egyptian Electricity Holding Company
EETC	Egyptian Electricity Transmission Company
EGP	Egyptian Pound
EgyptERA	Egypt Electricity Regulatory Authority
EOS	Egyptian Organization for Standards and Quality
FiT	Feed-in-Tariff
GW	Gigawatt
IPP	Independent Power Producer
LGC	Large Scale Generation Certificates
LRET	Large Scale Renewable Energy Target
MENA	Middle East and North Africa
MoERE	Ministry of Electricity and Renewable Energy
MW	Megawatt
NDC	Nationally Determined Contribution
NREA	New and Renewable Energy Authority
PV	Photovoltaics
R	Rupee
REC	Renewable Energy Certificate
RET	Renewable Energy Target
SME	Small Medium Enterprises
SHCP	Solar Homes and Communities Program
SRES	Small-Scale Renewable Energy Scheme
LCOE	Levelized Cost of Electricity
STC	Small Scale Technology certificate
UNDP	United Nations Development Programme
USD	United States Dollar
WUA	Water Users Association

1. CONTEXT AND RATIONALE

Egypt's energy sector is facing mounting economic pressure; currently a significant portion of the country's natural gas is imported to operate its power plants. That pressure is exacerbated by geopolitical instability in the region, which among other things has tripled Egypt's monthly natural gas import bill[2]. Concurrently, Egypt is mandated to implement economic reforms and tighten its monetary policies to reduce inflation, which has included the gradual removal of energy subsidies.[3] The result has been an impact on the daily lives of Egyptians—particularly farmers, small producers and low- to middle-income households—who bear the brunt of rising costs, energy insecurity and livelihood instability.

The government is responding to these compounded challenges by investing heavily in renewable energy, aiming to increase energy security and cut its fossil fuel import bill all the while meeting its Paris Agreement commitments. Egypt's national strategies include the National Determined Contributions (NDCs) and Climate Change Strategy 2050; the goal is to generate 42% of electricity from renewable/low carbon sources by 2030,[4] with statements by the Ministry of Electricity and Renewable Energy suggesting a target of up to 60% by 2040.[5]

Such an energy transition strategy is not only economically imperative, but it is also highly achievable thanks to the country's large solar energy capacity (Egypt has some of the highest solar irradiance levels in the world ranging from 1,970 to 3,200 kWh/m2/year from north to south).[6] This provides a reliable, secure and infinite foundation for clean power generation close to the point of consumption.

Currently, the government's primary focus is on utility-scale renewable projects, for example the Benban solar farm and Gaba El Zeit wind farm. Other projects which are under construction/in the pipeline/announced include the Suez 1 GW wind farm, West Sohag 10 GW wind farm and Obelisk 1.1 GW solar PV with storage. Egypt nonetheless has significant potential to increase its renewable energy share through DRE systems, particularly rooftop solar and small-scale agricultural systems.



[2]Kawach, N., 2026, Egypt faces steepening gas import bill due to Iran war, Arabian Gulf Business Insight, https://www.agbi.com/energy/03/2026/egypt-faces-steepening-gas-import-bill-due-to-iran-war/
[3]International Monetary Fund, 2026, IMF Executive Board Completes the Fifth and Sixth Reviews Under the Extended Arrangement Under the Extended Fund Facility and First Review Under the Resilience and Sustainability Arrangement for Egypt, International Monetary Fund, https://www.imf.org/en/news/articles/26/02/2026/pr-26064-egypt-imf-completes5-th-and6-th-revs-under-ext-arrange-under-eff-and1-st-rev-under-rsa
[4]In the updated NDC the %42 target is by 2030 and in the NCCS 2050 by 2030 .2035 is likely the right figure given the updated NDC succeeds the NCCS 2050.
[5]State Information Service, 2025, Egypt Targets %42 renewable energy share by 2030, rising %60 by -2040 PM, SIS, https://sis.gov.eg/en/media-center/news/egypt-targets-42-renewable-energy-share-by-2030-rising-to-60-by-2040-pm/
[6]World Bank, 2018, Egypt: Energy Sector Assessment, Strategy, and Road Map, Washington, DC. https://documents1.worldbank.org/curated/en/588971544207642729/pdf/Report.pdf

There are many successful global examples in which DRE plays a key role in increasing the renewable energy share. Examples include Australia, a developed economy with 65% of its total solar PV systems capacity from DRE,[7] and Pakistan, an emerging economy with an estimated 95% of solar PV applications from DRE,[8] with most of this growth occurring only in the last three years.[9]

DRE would not only save energy for consumers as electricity tariffs rise, but could also alleviate the fiscal burden on the government budget. For the last few years, the Egyptian government has set a clear direction to privatize its utility scale infrastructure, which can be clearly observed in both the desalination- and green hydrogen/ammonia-related strategies and policies.

During the February 2026 multi-stakeholder roundtable[10] held in partnership with the Pathways Beyond Neoliberalism program and SCEN MENA, DRE was identified as a key tool to promote a transition rooted in justice and resilience. The following opportunities were identified by participants:

- Expand access to affordable energy;
- Strengthen local economic resilience;
- Enhance community-level energy sovereignty
- Ensure societal acceptance of climate policies by linking them to everyday needs

That being said, while Egypt boasts a solid regulatory foundation for renewables, a significant gap remains between policy design and actual implementation. Small-scale producers continue to face steep barriers, which were identified during the roundtable, including limited access to concessional finance, high up-front costs, complex grid-connection procedures and institutional coordination gaps.

Addressing these barriers is critical to ensuring Egypt's energy transition achieves justice and equity for all. A just transition dictates that the shift away from fossil fuels must not place an undue burden on vulnerable segments of society; rather, it must serve as a catalyst for equitable economic development, local job creation and long-term community resilience.

Building on the findings of the February 2026 roundtable, this policy brief outlines practical pathways to scale DRE, with a view to contributing to a just, resilient and people-centered energy transition. The report begins by reviewing the current regulatory status in Egypt and identifying key barriers to the implementation of DRE systems. It then delves deeper into international examples of promoting DRE, and finally it discusses key recommendations which are tailored for policymakers and regulators.



[7] Foley, Ev., 2025, Australia breaks record with 5.2 GW solar installations in 2024: IEA report, PV Magazine, https://www.pv-magazine-australia.com/20/11/2025/australia-breaks-record-with-2-5-gw-solar-installations-in-2024-iea-report/
[8] Approximately %75 rooftop systems (21.9 GW), %19 ground mounted DREs' and %5 utility scale.
[9] TransitionZero, 2025, Shedding light on Pakistan's distributed solar revolution, TransitionZero, https://www.transitionzero.org/shedding-light-on-pakistans-distributed-solar-revolution
[10] For more on the roundtable discussion and its finding, please read the roundtable report https://www.greenpeace.org/mena/en/roundtable-report/

2. DRE GOVERNANCE

2.1 REGULATORY FRAMEWORK

DRE in Egypt is regulated through the constitution, national laws and the electricity regulator (EgyptERA) periodic circulars and grid-connection rules. Laws and regulations are complemented by national strategies.

2.1.1 NATIONAL LAWS

a) The Egyptian Constitution

Article Number	Constitutional Provisio (English Translation)	Relevance to Decentralized Solar Energy Systems
Article 23	**Scientific Research** *"The State guarantees the freedom of scientific research and encourages its institutions as a means to achieve national sovereignty, build a knowledge economy, and support researchers..."*	**Local Innovation and Research and Development** Mandates state support for research into solar PV technologies, smart microgrids, energy storage solutions (batteries) and decentralized grid-integration mechanisms tailored to Egypt's local climate and urban/rural layouts.
Article 27	**Economic Systems and Sustainability** *"The economic system aims at achieving sustainable development, social justice, raising growth rates and standards of living, increasing job opportunities... while preserving the environment."*	**Energy Democratization and Local Development** Decentralized solar energy empowers households, farmers and SMEs to generate their own power, reducing energy poverty in remote areas and fostering green job creation locally.
Article 32	**Natural Resources and Renewable Energy** *"...The State is committed to making optimal use of renewable energy sources, motivating investment therein, and encouraging related scientific research. The State also works on encouraging the manufacturing of raw materials and increasing their added value in accordance with economic feasibility."*	**Primary Constitutional Basis** Provides direct constitutional backing for incentivizing distributed PV investments (e.g., rooftop solar, net-metering schemes and private off-grid systems). Mandates supporting local manufacturing of solar components for small-scale installations.
Article 46	**Right to a Healthy Environment** *"Every individual has the right to a healthy, sound environment; its protection is a national duty. The State is committed to taking the necessary measures to preserve it, prevent harm to it, and ensure the rational use of natural resources to achieve sustainable development..."*	**Environmental Protection and Efficiency** Decentralized solar systems reduce reliance on centralized fossil-fuel power plants and cut grid transmission losses. Localized solar generation directly enforces the state's duty to protect the environment and utilize solar radiation efficiently.

b) Laws Governing DRE:

Legislation	Key Provisions Regulating Solar Energy	Regulatory Gaps and Limitations (DRE Focus)
Law No. 203 of 2014	**Stimulating the Production of Electricity from Renewable Energy Sources** Focuses primarily on large-scale, centralized utility projects. Includes indirect provisions that serve as a green light for the private sector and individuals to produce decentralized energy, establishing general frameworks (e.g., enabling private solar/wind generation and obligating distribution companies to purchase, transmit and connect DRE projects to their grids).	**Lack of Concrete DRE Incentives** Despite its title, the law fails to establish real, tangible financial or administrative incentives specifically tailored to encourage DRE. Remains structurally biased toward large-scale, centralized IPP models.
Law No. 87 of 2015 (and its Executive Regulations)	**Electricity Law** Regulates the technical and operational details for small-scale and decentralized energy. Mandates EgyptERA to regulate operational details including the net metering system.	**Excessive Regulatory Delegation** Lacks explicit statutory guarantees for DRE within the primary law, delegating operational frameworks entirely to executive decrees and administrative rules.
Article 4	Empowers EgyptERA to establish rules and procedures for developing/ encouraging electricity production from renewable sources and enhancing energy efficiency.	
Article 13	**Captive Generation Exemption** Captive Generation Exemption Exempts self-consumption electricity producers from needing to obtain permits/ licenses via an application to EgyptERA, provided: 1. 100% facility ownership belongs to the legal entity consuming the power; 2. Capacity is ≤500 kW (grid-synchronized or off-grid) or >500 kW (only if not grid-synchronized); 3. No third-party electricity supply agreements exist. EgyptERA must be notified within ten business days if eligibility conditions lapse.	**Restrictive Exemption Thresholds** Capping grid-synchronized licensing exemptions at 500 kW imposes administrative burdens on commercial and industrial prosumers seeking to deploy mid-scale rooftop or onsite DRE systems.
Article 49	**Distributor Mandates** Obligates network operators and licensed distributors to execute annual EgyptERA-approved plans targeting renewable energy promotion, demand-side management and energy efficiency (verified annually for license renewals).	**Absence of Binding DRE Quotas** While Article 49 mandates distributors to promote renewables, it lacks binding quantitative targets, financial obligations or feed-in incentives for distribution companies proactively to integrate decentralized systems.

2.1.2 DRE REGULATORY CIRCULARS

EgyptERA periodic circulars mainly target DRE. They establish the framework for net metering, self-consumption grid-connected solar DRE and, most recently, battery storage systems.

The Egyptian government took its first step in 2013 to support the implementation of DRE through regulatory incentives by establishing net metering rules. The relevant regulations were published through the 2013 Circular 1, with several variations through subsequent circulars as shown in the table below.

Net metering could be considered a generous incentive scheme, as it compensates all generated renewable energy on a 1:1 basis; that is, the grid acts as a virtual storage for excess electricity. By contrast, in net billing systems the excess electricity is purchased by the network operator at lower prices than the electricity tariffs.

Chronology of Egyptian DRE regulations:

Regulation	Description
Circular No. 1 of 2013	• The first policy issued to regulate decentralized grid-connected solar systems. • Distribution companies to install bi-directional meters for users. • Monthly excess electricity is credited to the user and carried forward to subsequent months within the same calendar year. Any surplus at the end of the calendar year is not carried forward to the following year. • EgyptERA to provide a tradeable renewable energy certificate for every MWh generated.
Circular No. 1 of 2017 (Q2 2017)	• Applied a net metering solar system size cap for a single DRE, i.e., 500 kWp. • Regulated accounting by subtracting supplied energy from consumed energy based on corresponding consumption tiers. • Introduced the purchase by the distribution company of any surplus electricity at the end of the calendar year, at a price equivalent to the average cost of electricity generation, with the value revised annually. • Clarified that the aim of the origin certificate is to inform the end consumer of the source of energy.
Circular No. 3 of 2017	• Increased the net metering solar system size cap for a single DRE to 20 MW. • Mandated the distribution company to purchase any remaining surplus balance at a price equivalent to the cost of the generated electrical energy.
Circular No. 5 of 2017	• Issued a standardized model contract to be executed between the distribution company and consumer for electricity exchange and grid connection, for grid-connected solar systems up to 20 MW. • Stipulated that the company has the right to terminate the contract if: 1. The consumer stops supplying electricity for 180 days (6 months); 2. System components are replaced without notifying the company; or 3. Electricity is supplied to third parties without an official permit from the company.
Circular No. 3 of 2018	• Net metered solar systems must be within the user's premises. • Further constraints added as follows:

Regulation	Description
Circular No. 2 of 2020	• Net metered solar systems must be within the user's premises. • Further constraints added as follows: o Total DRE system sizes connected to a single distribution company not to exceed 1.5% of the latter's peak demand; o Users' DRE system size not to exceed their peak demand; o Fist cap for the net metering scheme set at 300 MW; o Grid-connection fees implemented for the first time; and o Grid impact study required in cases of medium voltage connection. • Limited net metering benefit for singles users to 25 MW (20 MW for a single project). • End of year excess now estimated based on the latest price agreed between EETC and solar producers.
Circular No. 6 of 2022 **Changes made in response to COP 27 held in Egypt**	• Increased net metering solar system size cap for a single DRE system to 25 MW. • Removed the condition for maximum DRE system size for distribution companies. • Increased net metering cap from 300 to 1000 MW. • Increased net metering cap per single user to 30 MW (25 MW for a single project). • Scrapped grid-connection fees for systems <1 MW.
Circular No. 10 of 2022	• Contract Model Amendment (up to 20 MW): Amended the model electricity exchange and grid-connection contract for solar plants with capacities of up to 20 MW. • Bilateral Restructuring: Changed the net metering contract models to be strictly between two parties only: the distribution company and the consume. • Maintenance Obligations: Introduced a text mandating the consumer's obligation to handle the maintenance of the plant, in addition to maintaining all other previously mentioned clauses.
Circular No. 3 of 2023	• Pertains to off-grid stations with a capacity exceeding 500 kW and a maximum subscriber capacity of 30 MW: Required subscribers to install a meter to measure total electricity consumption. For stations exceeding 10 MW, the grid operator is obligated to install a meter at their own expense. Subscribers are required to pay the connection fee retroactively. • Limited the total capacity of PV solar energy projects under net metering and self-consumption systems throughout the country to 1000 MW or below, including existing capacity.
Circular No. 6 of 2023*	• This amendment is considered one of the important amendments. It expanded the concept of the station site to include several adjacent properties, permitting generating plants to be located outside the boundaries of the consumer's property including on adjacent or nearby land. That allowed some economic models, such as agricultural projects, to benefit from the self-consumption rules and systems.

Regulation	Description
Circular No. 10 of 2023	• Exempted projects in existence prior to Circular No. 3 of 2022 from paying the integration fee on electricity generated before the Circular was issued.
Circular No. 1 of 2024	• Cancelled the integration fee for electricity production projects from renewable energy sources as an incentive for companies operating in electricity production from renewable sources.
Prime Minister Decree No. 1539 of 2025	• RECs considered a tradeable financial instrument.
Circular No. 4 of 2026	• Introduced the potential to increase the net metering cap where the 1 MW cap is fulfilled in a shorter period. • Required all solar equipment needs to meet Egyptian standards as issued by the EOS, if applicable. • Maximum system size limit to be determined on a case-by-case basis by the relevant distribution company, to ensure the network is not negatively impacted. • Required 25% of DRE system needs to be from local components (including engineering and design costs). • Obliged DRE systems >100 kWp to sign a maintenance contract with a certified company. Annual maintenance reports to be submitted to the relevant distribution company. • Required remote monitoring for systems <100 kWp. • Set a standard processing time.
Circular No. 5 of 2026	• Regulated requirements for issuing permits and licenses for installing BESS. • Explicitly differentiates between: 1. Batteries integrated as part of a renewable energy plant (solar/wind hybrid + BESS), where fees are collected based on the plant as a whole; and 2. Standalone BESS where fees are collected independently. • Exempted micro BESS (small-scale storage systems) and pilot projects from licensing fees.

The sequence of Circulars suggests that the rules seem to be more politically driven than market or strategy/target driven. For instance, at the beginning of the scheme there was clear encouragement of DRE, but then in 2020 heavy constraints were added in terms of introducing several caps for system size. Eventually, on the back of COP27, most of these constraints were annulled to align with the government's positioning as a key climate player.

The net metering scheme came to a sudden halt in October 2025, and it was not until the release of Circular No. 4 of 2026 that the net metering scheme was resumed with more guiding rules concerning the use of local components and maintenance requirements. A key change brought in by this circular was that it left approval decisions entirely in the hands of the relevant distribution company. That ensured there would be no impact on the grid, as opposed to the previous one-size fits all approach, e.g., allowing DRE of up to 1.5% of the distribution company's peak demand (Circular No. 2 of 2020). While that step is aligned with best practice (see for example Australia's rules regarding grid connection), lack of transparency could be a challenge. Transparency is key to attracting private sector participation in the market as it gives clear assurance of future cash flows for prosumers and a degree of certainty in market demand for developers.

Circular No. 4 of 2026 also addresses a previous key challenge to DRE: the tedious and lengthy grid-connection approval process which can take more than 12 months.[11] Circular No. 5 of 2026 introduced a fixed, binding timeline.

Circular No. 5 of 2026 regulates the licensing requirements and conditions for BESS, introducing a bifurcated licensing fee framework:

Integrated Systems (solar/wind hybrid + BESS): A single consolidated licensing fee covering the entire integrated facility (generation + storage).

Standalone BESS: Subject to independent licensing fees as a standalone facility.

Licensing Fee Exemptions:

Pilot Projects: Projects officially approved by a decree from the MoERE or the EgyptERA Board of Directors.

Micro BESS: Small-scale storage systems connected directly to end-consumers (e.g., buildings or industrial facilities) which provide grid-supporting services and have a capacity exceeding 1 MWh.



[11] KEN Research, 2025, Egypt Renewable Energy EPC and Solar Parks Market, KEN Research, https://www.kenresearch.com/egypt-renewable-energy-epc-and-solar-parks-market

2.1.3 NATIONAL STRATEGIES & POLICIES

Integrated and Sustainable Energy Strategy (Energy Strategy 2035):

- Rapid expansion of solar and wind energy projects to achieve the 42% renewable energy target.
- Of that 42% target, 25% is explicitly allocated to solar energy alone (including PV and concentrated solar power).

Egypt's National Climate Change Strategy 2050:[12]
The strategy explicitly outlines the following core objective:

Achieving Sustainable and Low-Emission Economic Growth across Various Sectors:

The energy sector is one of the largest contributors to greenhouse gas (GHG) emissions, representing approximately 64.5% of total GHG emissions according to the Biennial Update Report (BUR) prepared in 2018. These emissions result from the combustion of natural gas and petroleum products for energy production. Electricity generation plants in Egypt rely primarily on natural gas due to the self-sufficiency achieved following recent discoveries. Nevertheless, the contribution of new and renewable energy sources to electricity generation reached 4.4% in the 2019/2020 fiscal year, marking an increase of more than 2,000 MW compared to 2015/2016 levels. This was achieved through a mix of generation plants utilizing wind energy and solar energy (represented by photovoltaics and concentrated solar power), in addition to the contribution of hydropower sources—chief among them the High Dam—which represents another 7.6% of the generated electricity mix.

The Ministry of Electricity and Renewable Energy has undertaken several measures aimed at increasing the contribution of new and renewable energy, which is planned to reach 42% of the total generated electricity by 2035.

The following strategic directions contribute to achieving this sub-objective:

- Widespread deployment of utility-scale (centralized) renewable energy systems, such as wind farms, concentrated solar power, PV plants and bioenergy plants.
- Promoting small-scale decentralized systems, including waste-to-energy, bioenergy, rooftop solar PV and solar water heaters.
- Developing new technologies to accommodate and integrate the utilization of renewable energy sources, such as smart control systems.
- Maximizing the utilization of renewable energy in off-grid applications.
- Leveraging energy storage technologies—such as batteries, molten salt and pumped-storage—while integrating new alternative energy sources such as green hydrogen, blue hydrogen and nuclear power.
- Increasing the use of renewable energy for electricity generation within industrial facilities and expanding solar thermal applications in industrial processes.
- Phasing out coal and transitioning to low-carbon alternative fuels.
- Incentivizing the increased production and use of biofuels as a substitute for fossil fuels, while ensuring a Just Transition that takes into account the workforce employed in existing fossil-fuel-dependent facilities.

[12] For the entire strategy, see here https://www.eeaa.gov.eg/Uploads/Topics/Files/20221206130720570.pdf

2.1.4 THE EVOLUTION OF NDCS AND THE DECENTRALIZED SOLAR GAP

Alignment of NDCs and the Implementation Gap

Egypt's climate commitments under the Paris Agreement have progressively evolved through the formulation of its NDCs. These policy updates serve as the international benchmark for Egypt's climate ambitions, operating in tandem with the National Climate Change Strategy 2050 to achieve the milestone target of generating 42% of the country's electricity from renewable and low-carbon sources.

Textually, Egypt's NDCs explicitly recognize the importance of decentralization. The framework formally mandates the activation of the role of electricity distribution companies to improve energy efficiency and actively promote both large-scale and small-scale DRE systems for subscribers, primarily through the implementation of Sustainable Energy Action Plans as required by the Electricity Law No. 87 of 2015. Furthermore, the NDCs pledge to improve and upgrade transmission and distribution networks, emphasizing the transition to smart grids and control centers as a core means of reducing carbon emissions and optimizing infrastructural investments.

However, there remains a significant gap between high-level policy design and actual execution. While the NDCs provide a solid rhetorical and legal foundation for small-scale generation, they fall short of translating these broad commitments into quantifiable, binding sub-targets (such as a specific MW allocation for rooftop solar) or dedicated international compliance and funding pathways. In practice, national procurement strategies and capital allocation remains structurally biased toward centralized, GW-scale mega-projects. Consequently, despite their explicit inclusion in the NDC text, decentralized systems are effectively sidelined in the core execution roadmaps and state-backed financial guarantees.

Instead of being championed by national climate pledges, small-scale producers are left to navigate an unfavorable ecosystem. The very entities tasked by the NDCs with promoting DREs—the electricity distribution companies—often oversee complex grid-connection procedures and institutional coordination gaps which stall development. This is compounded by deep structural barriers, including many which were identified during the February 2026 roundtable such as severely restricted access to concessional finance and prohibitively high up-front capital costs.

For Egypt's NDCs truly to bridge the gap between policy and reality, future textual revisions must evolve beyond simply acknowledging DREs to operationally empowering them. The framework must treat decentralized solar energy as a standalone strategic pillar with binding execution timelines, explicit funding mechanisms and transparent grid-access rules, thereby unlocking the smart grid transformation promised in Egypt's international pledges to empower everyday citizens and small-scale producers.





2.2 INSTITUTIONAL ARRANGEMENTS

DRE in Egypt is regulated through the constitution, national laws and the electricity regulator (EgyptERA) periodic circulars and grid-connection rules. Laws and regulations are complemented by national strategies.

1. MoERE

The highest sovereign authority responsible for drawing up the state's general policies in the energy sector and developing national strategies (e.g., the Integrated and Sustainable Energy Strategy). Major executive bodies fall under its umbrella.

2. NREA

The main executive driver and primary hub for investors in this field, specifically regarding centralized activities and mega-projects. NREA undertakes the following tasks:

- Quantifying and assessing solar energy resources and conducting the necessary technical studies in this regard.
- Allocating and managing state-owned lands designated for establishing large-scale solar energy projects (whether implemented by the state or the private sector).
- Taking responsibility for the qualification and accreditation of contracting and supplying companies that install decentralized rooftop solar stations.
- Setting the specification standards and quality requirements for small-scale solar equipment and components (e.g., panels, inverters) in cooperation with the EOS.

Despite its primary focus on utility-scale projects, NREA's role in decentralized activities is vital for consumer protection and ensuring market quality.

3. EgyptERA

Considered the primary body for decentralized activities from a regulatory perspective; it is the entity competent to issue circulars and decrees which govern this sector. Among its most important roles in regulating decentralized activities are:

- Formulating and issuing regulations governing the **net metering** and **self-consumption systems**.
- Determining the maximum capacity caps for connection per distribution company, as well as the cumulative allowable capacities for decentralized plants nationwide, to ensure grid stability.
- Determining the **integration fee** (the technical and reciprocal grid-support fee paid by decentralized plants in exchange for using the network).
- Issuing and exempting licenses (individuals and small-scale decentralized projects are exempt from complex licensing conditions up to a certain capacity, requiring only the approval of the distribution company).

4. EEHC and Subsidiary Companies

Operational roles are divided into two main branches:

EETC: Handles utility-scale solar projects (such as the Benban Solar Park). Responsible for purchasing energy produced by investors on high and ultra-high voltage grids and connecting it to the national grid.

Geographic electricity distribution companies: These companies serve as the primary and most critical point of contact for citizens or investors wishing to establish a decentralized solar plant. Egypt is divided geographically into nine distribution companies. These companies are responsible for:

- Receiving and processing connection requests for small- and medium-scale solar power plants (under either the net metering or self-consumption systems).
- Conducting site inspections, testing smart bidirectional net meters (**smart net metering**) and supervising the connection of the plant to the local distribution network (low and medium voltage).
- Performing annual or monthly clearing and settlement to account for the surplus energy injected by the decentralized plant into the grid.

5. Egypt Solar Energy Platform – PV HUB[13]

- Provides citizens with comprehensive data regarding solar PV systems, allowing easy access to estimated installation costs, required procedures, and documentation for installation and grid connection, while offering updates on the latest developments in the field.
- Enables installers of solar PV systems to track the issuance or renewal of grid-connection qualification certificates, monitor market developments and track capacities.
- Issues periodic reports and provides data on all qualified companies operating in the field.

6. Industrial Modernization Centre (IMC)[14]

A government entity that works on transitioning facilities (industrial, commercial, tourism, residential and public buildings) toward reliance on new and renewable energy. Its scope centers on decentralized activities within these sectors. IMC has implemented **the grid-connected small-scale solar photovoltaic systems project (Egypt-PV)**, through which it works on:

- Providing technical support and consultations for companies and factories wishing to transition to decentralized solar energy.
- Providing financial incentives (often via grants in cooperation with UNDP) to support the establishment of model decentralized plants.
- Developing and training qualified cadres and technicians in the installation and maintenance of decentralized systems to enhance the local market's efficiency.
- Cooperating with international bodies to enhance local manufacturing capacities and provide technical support to the industrial and commercial sectors for transitioning toward clean energy.

7. Ministry of Local Development and various local units

A local administrative body which intervenes in the structural and engineering aspects of decentralized plants by issuing engineering licenses or structural approvals to verify the **structural stability** of buildings and factory rooftops prior to installing metallic mounting structures for solar panels. This is to ensure the building is not adversely affected by weight loads or wind forces.

[13] https://pv-hub.org/
[14] https://www.imc-egypt.org/ar/

8. Financial Institutions

Financing is the backbone of decentralized activities. Banks and other financial institutions—such as consumer finance companies—intervene by providing accessible financing mechanisms and soft credit facilities for those wishing to purchase solar energy units and equipment, particularly for individual installations. The CBE has issued several decrees in this regard.

9. Community-based arrangements

Water Users Associations (WUAs): WUAs, as provided for under the Water Resources and Irrigation Law No. 147 of 2021, are local organizational entities through which farmers and beneficiaries participate at the level of *mesqas* (private irrigation ditches), canals, drains and wells. WUAs aim to activate beneficiary participation alongside the Ministry of Water Resources and Irrigation in managing, operating and maintaining irrigation systems equitably and effectively.

WUAs are entities that incorporate all water users and beneficiaries of public or private irrigation and drainage systems, groundwater wells, dams and reservoirs across both old and new lands[15] within designated command areas (*zemams*). Governed by a structured institutional hierarchy—featuring a Secretary-General at the governorate level and a Secretary-General for the General Assembly at the national level—these associations aim to activate beneficiary participation alongside the Ministry in managing, operating and maintaining irrigation and drainage networks to optimize resource efficiency and safeguard water supplies.

Beyond water management, WUAs serve as an effective community-driven model for scaling DRE in the agricultural sector. By unifying smallholder farmers under a single legal entity, these associations enable collective ownership and operation of shared solar-powered irrigation systems. This collaborative framework significantly lowers capital expenditure per farmer, satisfies the single-entity ownership requirement under Article 13 of the Electricity Law No. 87/2015 for licensing exemptions, and establishes a structured mechanism for long-term operation and maintenance.

Agricultural cooperatives: Provide an established institutional framework to finance, deploy and manage decentralized solar energy projects. Utilizing recognized legal status as a single entity, cooperatives can overcome individual credit barriers to secure concessional financing and soft loans from ABE. Operating as collective prosumers under shared self-consumption arrangements allows cooperatives to insulate vulnerable smallholders from fossil fuel price shocks and climate impacts while ensuring a just energy transition.

Emphasizing cooperatives' 'single legal entity' status addresses the strict ownership requirement of Article 13 of the Electricity Law No. 87/2015, ensuring smallholders can qualify for licensing exemptions.

Framing WUAs and agricultural cooperatives as 'collective prosumers' enables them to access ABE concessional loans and reduce individual capital expenditure.



[15] 'Old lands' are Egypt's long-established agricultural areas in the Nile Valley and Delta; 'new lands' are desert areas reclaimed by the government for agriculture, mainly since the 1950s.

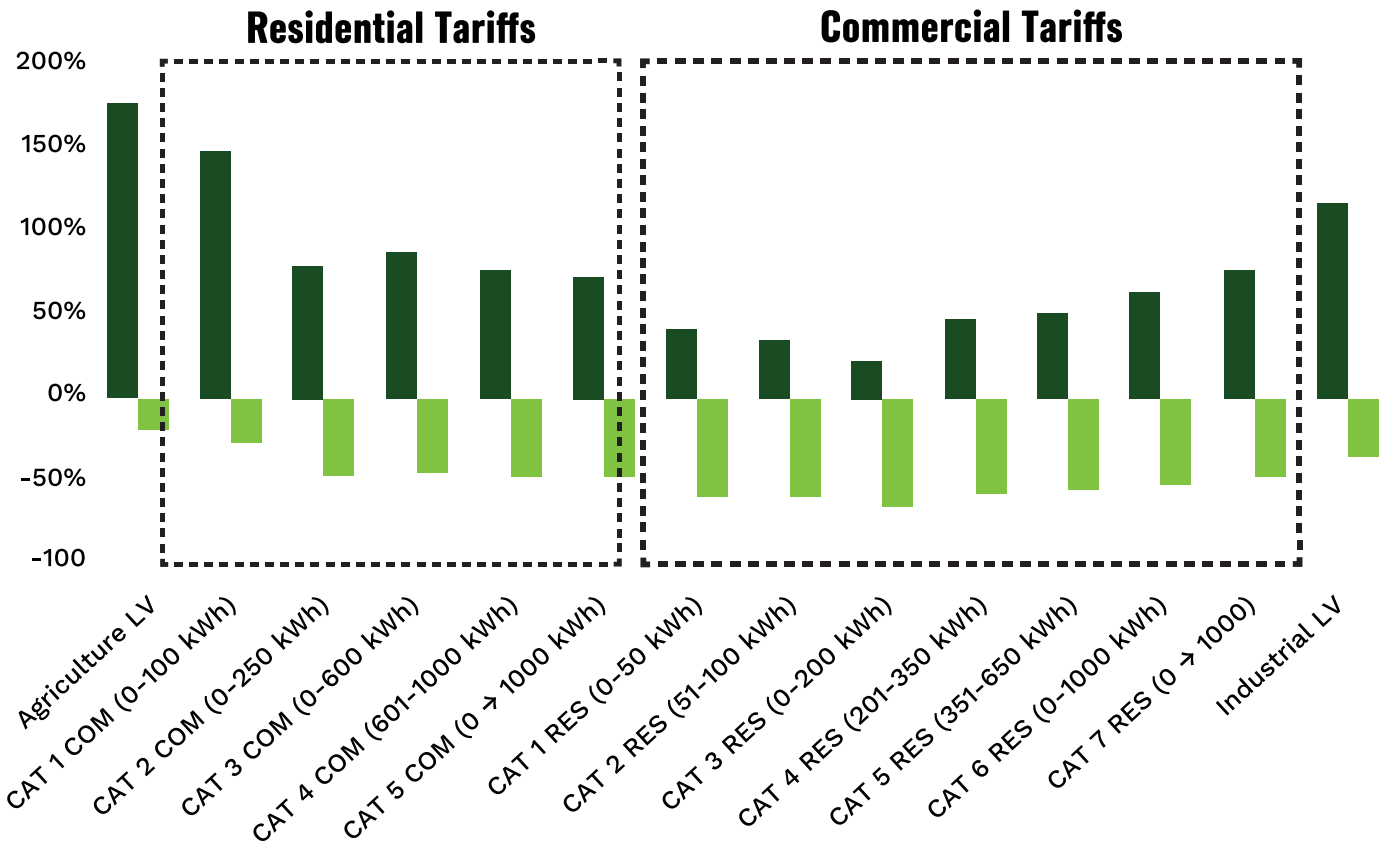
2.3 ELECTRICITY TARIFFS

Since COVID-19, the Egyptian government has taken drastic steps to limit the pandemic's impact on the economy. One of those steps was to freeze electricity prices for a period of 3-5 years. Since then, Egypt has experienced heavy inflation and devaluation of its currency.

Following its intention to remove subsidies gradually, the government resumed increasing electricity prices in 2024, with subsequent increases in 2025 and 2026. Not all sectors have experienced the same increase, with small industrial, commercial and agriculture users experiencing huge increases while by contrast low-income, low electricity-using households experienced the lowest tariff increase (see Figure 1). In keeping with the government's goal to protect residential electricity users, the most recent August 2026 increase kept tariffs essentially untouched for residential users[16]. Equally, tariff increases for commercial users have not matched the sharp devaluation experienced in the last few years. Even after such significant tariff increases—in some cases exceeding 100%—due to USD inflation in real time the tariffs in fact decreased by approximately 50%.

This in turn, and together with high borrowing interest rates, heavily impacted the feasibility of distributed solar systems and significantly extended the payback time period, in many cases causing DRE to be essentially unprofitable. This was due to the LCOE exceeding the tariffs; between 2022 and 2026, solar system-specific costs dropped sharply by on average 60%,[17] which was most likely driven by the global overcapacity of modules manufacturing that was experienced in 2023.[18]

Figure 1: Percentage increase in tariffs 2021 to 2026*
**Please see the table in Appendix I for detailed tariff values*



[16] Government further increased the residential sector tariff by up %12 with still the lowest consuming category untouched, and third category only experiencing %5 increase.
[17] Based on actual local tender pricing for a 1 MWp solar system.
[18] IEA, 2026, Solar PV continues to dominate global renewables growth, though at a slower rate, IEA, https://www.iea.org/energy-system/renewables/solar-pv

3. DRE APPLICATIONS & KEY BARRIERS

3.1 GRID-CONNECTED SYSTEMS

With the implementation of the net metering scheme in 2013, grid-connected solar PV systems have been increasingly adopted in various applications, especially in the agriculture and industrial sectors, but with less success in the residential sector.[19] However, current EgyptERA data shows that grid connected DRE capacity remains quite low, with approximately 213 MW in net metered systems installed and 82 in self-consumption.[20] DRE could play a key role in Egypt that goes beyond fulfilling its renewable energy target of 42% by 2035. Indeed, on a macroeconomic level, if DRE reached the same levels experienced in other successful markets countries such as Pakistan, Australia or the USA, significant cuts to the fossil fuel import bill could be achieved—a crucial economic necessity for Egypt. On top of that, DRE in general would help postpone expensive grid infrastructure upgrades by reducing peak loads. On a consumer level, with the government's intention to remove electricity and energy subsidies generally, DRE is poised to provide wide opportunities to save on electricity bills. In Pakistan, for example (as discussed in 4.3), electricity tariff increases were a primary driver of the explosive increase in DRE applications.

Despite such clear advantages, it is clear that grid-connected DRE still has limited application, with the total capacity of DRE barely reaching 25% of the 1000-MW target set by EgyptERA. The key factors behind the limited application of grid-connected DRE are as identified below.

3.1.1 TARIFF SUBSIDIES

One of the main barriers impacting the implementation of solar energy systems is low electricity tariffs. As discussed above, despite Egypt beginning to increase tariffs in 2024, in real terms when comparing the EGP to the USD the tariffs have in fact decreased.

Tariffs currently range between 1 and 5.7 USD c/kWh. According to 2019 World Bank data, this is far below the global average which stands at approximately 17.5 c/kWh.[21] Conversely, as solar PV equipment is mostly imported, the price of PV systems was heavily impacted by the EGP devaluation; indeed, the recent drop in the price of PV systems increased the return on investment. Nevertheless, there is significant room for improvement. As shown in Table 1, with current tariff rates and assuming they will continue to increase together with USD inflation, distributed solar systems will make economic sense—with a payback time of under six years for high-energy consuming residential users, mid- and high-energy consuming commercial users as well as industrial and agricultural users. The payback time would significantly improve for all users if the government were to increase tariffs aggressively to reach pre-COVID values.



[19] Badr, A, 2024, Fulfilling the potentials of residential solar energy in Egypt. Building Engineering, 1510 ,(2)2, https://ojs.acad-pub.com/index.php/BE/article/view/1510

[20] EgyptERA, 2026, Capacity of PV power plants connected to the grid, EgyptERA, https://egyptera.org/en/TotalSolarEnergyCapabilities.aspx

[21] World Bank Group, 2026, Electricity Prices by Country, World Bank Group, https://databank.worldbank.org/Electric-Prices-by-Country/id/7b12e#700

Table 1: LCOE of Distributed Solar PV Systems and Discounted Payback Time*

	Discounted Payback Time (YEARS				Pre-COVID Rate (USD c/kWh)	July 2026 Rate (USD c/kWh)[22]
	Rates equivalent to USD Inflation		Pre-COVID Rates within 4 Years, followed by USD Inflation Rates[23]			
	Full Equity	70/30 D/E Ratio**	Full Equity	70/30 D/E Ratio**		
Residential CAT 1	Not Feasible	Not Feasible	Not Feasible	Not Feasible	3.1	1.3
Residential CAT 3	Not Feasible	Not Feasible	14.5	19.2	4,9	1.9
Residential CAT 4	Not Feasible	Not Feasible	7.5	8.9	6.8	3.0
Residential CAT 7	6.5	8.4	4.8	5.4	9.2	5.1
Residential CAT 1	24.8	Not Feasible	15.2	18.4	4.1	3.2
Residential CAT 3	6.3	8.0	4.8	5.4	8.9	5.2
Residential CAT 5	5.9	7.4	4.4	4.7	10.2	5.5
Industrial LV	5.9	7.6	5.0	5.8	8.0	5.4
Agricultural LV	6.1	7.7	6.2	8.0	6.1	5.2
LCOE (US c/kWh)					3.27	3.67

** 23% interest rate assumed with 7 years tenure. Specific costs for the solar system assumed to be 300 USD/kWp. Foreign exchange rate used: 51 EGP/USD*
*** Debt-to-equity ratio*

[22] As of August 2026, there has been an on average %12 increase in residential sector tariffs. This is not expected to affect the results/conclusions discussed in this policy brief.
[23] This applies the assumption that the government will aggressively increase tariffs to reach pre-COVID rates within four years, and that thereafter tariffs will be simply adjusted in accordance with USD inflation.

3.1.2 OTHER REGULATORY BARRIERS

The other main challenge, as discussed in section 2.1.2, is that solar incentives regulations are highly uncertain and the politically driven, making it hard to assess the proper feasibility of solar PV systems. That is made more difficult due to there being no long-term purchase guarantee by the network operator.

On top of that, as more users install distributed solar systems, the revenue of distribution companies, as well as transmission and generation companies, is expected to fall while their expenses, especially those related to infrastructure, are expected to increase. While EgyptERA sets fixed costs for all users, which could address the revenue issue, such costs are insignificant and range from 0.02 to 0.8 USD per month per user.

The net metering scheme also doesn't differentiate between users and solar system size, which would result in an unnecessary burden on the EEHC budget and unjust distribution of benefits.

The incentives available are also not linked to any objective—most importantly the 42% renewable electricity by 2030 target—hence, there is no clear method for how such incentives will be phased out in the future. This exposes the market to sudden (expected) variations in the regulations. The only existing target, or better to call it a cap, is the 1,000 MW figure for net metering installation, which is very small. To put this into perspective, 1,000 MW would generate approximately 1,750 GWh.[24] That is just 0.8% compared to the total electricity consumption in 2023 of 215,130 GWh.[25]

Roundtable participants also pointed out that institutional fragmentation and lack of coordination—spanning ministries, regulatory bodies and sectoral actors—constitute a major bottleneck. Such fragmentation results in confusion regarding procedural steps, delays in implementation, and gaps between policy formulation and execution.

3.1.3 ACCESS TO FINANCE & AFFORDABILITY

Access to finance is another key barrier. High interest rates increased the LCOE by 12%, further elongating the payback time for grid-connected DRE. On the same note, the high initial investment cost remains a major obstacle for many users, whether residential, commercial or industrial.

3.1.4 GRID STABILITY

Grid weakness is another challenge for increased DRE uptake. While, generally, Egypt shouldn't experience grid instability issues given the current low variable renewable energy penetration (5% of the energy mix), grid weakness might be experienced in some rural areas. Weak grids, in addition to the general aging of grid infrastructure, leads to difficulty absorbing fluctuating renewable energy generation. There is no clear information, however, on the grid conditions in each distribution company jurisdiction and the ability to accommodate solar PV systems.

3.1.5 ACCESS TO INFORMATION & SUPPORT

Lack of structured awareness campaigns and extension services tailored for local communities and farmers emerged as a recurring theme during the roundtable. Potential users consequently remain poorly informed about the tangible benefits of DRE.

There are several initiatives working to address that information gap. For example, the Egypt Solar Energy Platform (PV HUB) provides valuable consultations and insights regarding procedural paths, estimated costs, and accredited installation and maintenance companies. Nevertheless, a substantial information gap persists and more work needs to be done.

3.1.6 INFRASTRUCTURE

Compared to many developed countries whose solar energy generation comes primarily from residential users, Egypt may not have the necessary unobstructed roof spaces needed for distributed solar energy systems. This is especially true for those with low and medium incomes, who are more likely to live in apartment buildings.

[24] Estimated assuming a 0.8 performance ratio and 6 kWh/m2 daily average global irradiation.
[25] IEA, 2026, Egypt, https://www.iea.org/countries/egypt/electricity

3.2 OFF-GRID SOLAR SYSTEMS

Off-grid systems are increasingly being implemented in Egypt, especially west of the delta or along the southeast coast where there is no grid access, to supply energy for agricultural and tourism use. These systems typically are hybrid systems integrated with diesel generators; however, there is a developing trend for hybrid battery energy storage systems.

A primary application of off-grid solar energy is solar PV pumping systems for crop irrigation. Many farmers have started to implement such systems to cut down on diesel generator costs, with reported payback times of typically less than 2.5 years.[26] Such systems are also used in areas where grid electricity is unreliable.

The expansion of implementation of solar PV pumping systems follows government policies and targets, including converting 3.7 million feddan from conventional high water-consuming flood irrigation to water-efficient modern irrigation techniques—i.e., drip and sprinkler irrigation[27] —and reclaiming desert areas particularly in the western delta, where 2.2 million feddans are to be reclaimed through the New Delta project.[28]

Agriculture employes 18% of the workforce, most of whom are farmers. In many cases, those farmers don't own the land, making them vulnerable to economic fluctuations; DRE would play a key role in increasing their resilience. This, however, must go hand in hand with water saving techniques, organic farming and smart agriculture to ensure the sustainability of production and hence income.

Despite the clear advantage of solar PV systems, their application still faces key barriers, mainly associated with access to finance. While the CBE offers a 5% initiative to support small farm holders (along with industrial and service sectors) with annual sales of less than 50 million EGP, many farmers are unable to give the proper guarantees needed by the banks.

Banks, from their side, try to accommodate for example by offering flexible loan repayment terms which more or less matche the crop harvesting cycle, e.g., quarterly payment instead of monthly. However, this doesn't work in all cases, e.g., for farmers with six-month harvesting cycles, which typically increases the risk of non-payment for the bank.

Consumers also face other challenges related to loan disbursement. In many cases, banks will wait for the service company to install the solar PV system before disbursing the loan. For some small service companies, this creates a cash flow bottleneck.

Finally, not all farmers have the necessary equity to meet the bank debt-to-equity requirements.



[26] Based on an unpublished market study conducted by Chemonics Egypt.
[27] State Information Service, 2022, State plans to get 3.7 million feddans to use modern irrigation systems in 3 years – min, State Information Service, https://sis.gov.eg/en/media-center/news/state-plans-to-get-37-million-feddans-to-use-modern-irrigation-systems-in-3-years-min/
[28] Fanack Water Editorial Team, 2025, Egypt's Mega-Irrigation Overhaul: Modernizing Agriculture for Water Security, Fanack Water, https://water.fanack.com/egypt-irrigation-modernization/

4. INTERNATIONAL EXPERIENCE

This section discusses the history of remuneration to promote DRE in France, Germany, Australia and Pakistan. Key success factors are identified, based on which recommendations will be developed in the next section.

4.1 GERMANY

Germany is a great example of government-driven regulatory incentives. In 1990, Germany was the first nation worldwide to set the regulatory framework for a nation-wide FiT for renewable energy, with the Electricity Feed-in Act.[29] In 2000, FiT was implemented through the Renewable Energy Sources Act (EEG 2000), obliging local grid operators to purchase renewable electricity injected into to the grid over a 20-year period.[30] The scheme is funded through the federal budget[31] and emissions trading revenues. Up until July 2022, a renewable energy surcharge supported the renewable energy scheme, but it was abolished[32] to reduce the burden on consumers especially following the significant increase in tariffs stemming from the Russia-Ukraine war.[33]

The main objective of remuneration for renewable energy was to kick-start the market by making solar PV systems profitable given their high cost at that time. Since then, remuneration rates have experienced consistent decline as the market has expanded and the cost of the PV systems dropped. Between 2010 and 2026, FiT experienced an over 80% reduction[34]. The largest drop occurred in 2011-2014, which seem to coincide with the large drop in modules cost as China expanded in their module manufacturing capacity.

Concurrently, with DRE implementation growing, the government began promoting self-consumption. It encouraged users to consume all renewable energy generated on-site and minimize export to the grid, to reduce system integration costs[35] associated with heavy variable renewable energy penetration. Accordingly, the government moved from using gross FiT remuneration until 2009 to a two-model remuneration tailored to the user's energy demand. The former was more beneficial to users with very low self-consumption, i.e., low load users such as barns or warehouses. The latter only renumerates the surplus feed, which is basically a net billing mode, allowing users to offset their demand when solar PV is generating energy. Any excess generation is then exported to the grid and renumerated at a rate typically lower than that of the gross FiT rate as well as the electricity tariff. This mode is beneficial when most solar PV generation is used on site, as it replaces expensive grid electricity. It should be noted that after 20 years, users are compensated for the excess energy based on the market price minus a small marketing fee (but capped at 10 c/kWh).

[29] Environmental and Energy Study Institute, 2010, Feed-in Tariffs, EESI, https://www.eesi.org/files/feedintariff_033110.pdf
[30] Heidelberg Amperfied, 2025, EEG feed-in tariff for solar systems: Comprehensive guide, AMPERFIED GmbH, https://www.amperfied.de/en/21/07/2025/eeg-einspeiseverguetung-fuer-solar-anlagen/?utm_source=chatgpt.com
[31] Federal Ministry for Economic Affairs and Energy, 2022, New impetus for renewable energies, translated from German, https://www.bundeswirtschaftsministerium.de/Redaktion/DE/Schlaglichter-der-Wirtschaftspolitik/-05/10/2022neuer-schwung-fuer-erneuerbare-energien.html
[32] Levy reduced to zero c/kWh in July 2022. The applicable law was abolished in January 2023.
[33] Transnet BW, n.d., Financing under the German Renewable Energy Act (EEG), Transnet BW, https://www.transnetbw.de/en/energy-market/renewables-and-levies/eeg-support
[34] Solar Check, 2026, Feed-in tariff 2026-2010: Development & Outlook, https://www.solarcheck-deutschland.de/einspeiseverguetung/entwicklung?utm_source=chatgpt.com
[35] Additional investment needed to balance energy flow in the network.

On the back of the Russia-Ukraine war and its significant impact on Germany's energy security,[36] a two-fold increase in remuneration for distributed solar PV systems took place through the Renewable Energy Sources Act 2023 (EEG 2023), with the objective now being to achieve the RET of 80% by 2030 which aligns with the 1.5°C Paris Agreement pathway. The RET was also broken down to include a 225 GW solar target, split between rooftop- and ground-mounted solar systems, a 115 GW onshore wind target and a 600 MW biomethane target to be used only in flexible power plants in the future.

Remuneration also varies based on the system size, i.e., <10 kWp, 10-40 kWp and 40-100 kWp, with smaller systems benefiting from higher remuneration. Conversely, larger renewable energy systems (>100 kWp) go through a tendering process with a tendering cap; once the cap is reached, the tender closes. Compensation for systems that win the tender is based on a premium, consisting of the bidding price on top of the average wholesale price. Similar to systems <100 kWp, contracts are also set for 20 years.[37]

To increase the certainty of remuneration to the market while ensuring available remuneration is aligned with RET progress and solar systems costs variations, remuneration is subject to a clear degression mechanism regulated through EEG 2023. The mechanism is revised every six months, with potential increase in degression rate if more solar PV systems are installed than planned.

It is worth mentioning that remuneration is halted when variable renewable electricity generation exceeds the total demand in the market. However, those hours where there is no remuneration are added to the 20 years to ensure consumers receive compensation for exactly 20 years.



[36] Federal Ministry for Economic Affairs and Energy, 2022, The first regulations of the new EEG 2023 come into force: priority for renewable energies and higher remuneration for solar power, translated from German, https://www.bundeswirtschaftsministerium.de/Redaktion/DE/Pressemitteilungen/-20220729/07/2022erste-regelungen-des-neuen-eeg-2023-treten-in-kraft.html
[37] Neumann, R., Rakholiva, K., 2026, Germany Commercial Solar Incentives 2026: KfW, Market Premium & Grants, SurgePV, translated from German, https://www.surgepv.com/blog/solar-incentives-subsidies-germany

4.2 FRANCE

France's regulatory incentives for distributed solar systems are quite similar to Germany's. France also began in 2000 by establishing the legal basis for the operator (for example, Électricité de France (EDF)), which is obliged to purchase generated renewable energy. However, it was not until six years later that FiTs, set by the Energy Regulatory Commission, started to be implemented.

France's remuneration model also shares the following with Germany:



20-year guaranteed purchase of generated solar energy under the EDF Obligation d'Achat Program.[38]



Two modes of compensation: gross FiT and net billing.



Reduction trend in the remuneration with a predictable degression rate.



Variation of remuneration according to system size.



Compensation of large solar PV systems through a bidding process run by the regulator. The difference, however, is that consumers are compensated through a 'contract for difference' model.



Remuneration degression rate is linked to both the cost of solar equipment and the relevant RET (i.e., 100 GW of solar energy by 2030). The closer France is to the RET, the lower the remuneration.

To further encourage users to move to self-consumption, the operator, on top of purchasing the excess energy generated, offers an additional rebate based on system size (the 'Prime a l'autoconsommation' bonus). The operator also offers an additional premium for solar PV systems used in agriculture (1.5-2 c/kWh above standard rates).

While France failed to meet its 2020 RET of 23%,[39] the 2030 RET was increased to 35%[40] but without any increase in solar PV remuneration. Conversely, Germany doubled remuneration based on the EEG 2023. Additionally, France's RET does not consist of specific sub targets for rooftop solar. Incentives are indirectly funded by consumers as part of an energy tax.[41,42] From 2022-2024, following the onset of the Russia-Ukraine war, France significantly reduced this tax by implementing a tax shield; however, the tax returned to pre-war levels in February 2024.[43]

Finally, to address the issue of grid saturation (i.e., when renewable energy generation exceeds demand), especially in rural areas, the distribution company Enedis can impose a cap limiting the amount of renewable energy that can be exported to the grid. This includes requiring some users to install power limiters. Enedis may even refuse connection in some cases, pending grid reinforcement being carried out. In an interesting measure to promote transparency, Enedis has produced online maps showing the levels of grid saturation by zone.

[38] Neumann, R.; Rakholiya, K. 2026 France Solar Policy 2026: Green Transition, Targets & Incentives, SurgePV, https://www.surgepv.com/blog/france-green-energy-transition
[39] Ayache, L; Nauges, S, 2023, France's Renewable Energy Acceleration Bill Removes Barriers to Project Development, McDermott Will & Schulte, https://www.mcdermottlaw.com/insights/frances-renewable-energy-acceleration-bill-removes-barriers-to-project-development/
[40] Ember, 2026, France was the biggest supplier of clean power in the EU in 2025, Ember, https://ember-energy.org/countries-and-regions/france/
[41] NZero, 2026, How Energy Levies Influence Infrastructure Funding and Business Electricity Strategies, NZero, https://nzero.com/blog/how-energy-levies-influence-infrastructure-funding-and-business-electricity-strat/
[42] Micco, 2024 ,2024 Everything you need to know about France›s electricity price hike, micco, https://www.micco.app/post/-2024everything-you-need-to-know-about-frances-electricity-price-hike
[43] LeFevre, V., 2026, Electricity taxation in France: an increased bill in 2025, sirenergies, https://www.sirenergies.com/en/article/electricity-taxation-in-france-an-increased-bill-in2025-

4.3 PAKISTAN

Being an emerging economy like Egypt, Pakistan is an interesting successful example of the implementation of distributed solar systems. In recent years, Pakistan has experienced a significant boom in DRE implementation, increasing from 1 MW in 2015-16[44] to over 6 GW of net metered systems in 2025,[45] one sixth of which was added in the first half of 2025 alone.[46] The initial spark that led to such boom was the increase in liquified natural gas prices caused by Russia-Ukraine war and significant blackouts experienced in the country due to gas shortages and concurrent intense heatwaves especially in 2022-23.[47] Another key driver for such a boom was the significant increase in domestic tariffs (155% in the past 3 years). It is therefore no wonder that nearly half of the distributed solar systems in Pakistan are implemented in the residential sector. In 2024, over 1.2 GWh of battery storage was imported, with many households and businesses now meeting their own electricity needs.[48]

Concurrently, the government provided generous incentives taking equity into account, including:

A concessional loans scheme launched by the State Bank of Pakistan. Partner banks offer concessional loans to customers with credit guarantee through the Green Climate Fund. The loans have a long tenure period of 10-12 years depending on system size, a generous grace period of three years for small systems (i.e., up to 1 MW) and a fixed 6% mark-up rate.[49]

A net metering scheme introduced in 2015 for distributed solar systems with capacity of up to 1 MW. The contract runs for seven years (as opposed to 20 years as in France and Germany).

Exemptions on import duties for solar panels and other equipment related to renewable energy generation.[50]



[44] Fahad, M., & Umar, M., & Dominguez, C., Kazmi, H, 2022. «The role of residential distributed energy resources in Pakistan›s energy transition,» Energy Policy, Elsevier, 167, http://www.sciencedirect.com/science/article/pii/S0301421522002798

[45] TransitionZero, 2025, Shedding light on Pakistan's distributed solar revolution, TransitionZero, https://www.transitionzero.org/shedding-light-on-pakistans-distributed-solar-revolution

[46] Bakar, A., 2025, Government Solar Policy & Net Metering in Pakistan, Integra Solar Pakistan, https://www.integrasolar.com.pk/government-solar-policy-net-metering-in-pakistan/

[47] Farand, C., 2026, How Pakistan's people-led solar boom is easing impact of Middle East energy crisis, the guardian, https://www.theguardian.com/environment/2026/mar/17/pakistan-people-led-solar-boom-middle-east-energy-crisis

[48] World Economic Forum, 2025, How Pakistan's energy revolution can power affordable, reliable electricity for all, https://www.weforum.org/stories/08/2025/pakistan-energy-affordable-reliable-electricity/

[49] State Bank of Pakistan, 2016, Incentives Schemes Renewable Energy, State Bank of Pakistan, https://www.sbp.org.pk/Incen-others/Rene.asp

[50] Power&Sun, 2026, Introduction to the Solar Panel Industry in Pakistan, Power&Sun, https://powernsun.com/solar-panel-industry-in-pakistan/?srsltid=AfmBOorsIZT-T7wiueeguK6IswwbLOcb5KiAu7PKS5muNacHRIWfe1t4

While Pakistan mainly relies on fossil fuel imports, exposing the economy to global energy price shocks, as of early 2026 the implementation of renewable energy has avoided approximately 12 billion USD in oil and gas imports.

As with France and Germany, Pakistan started with generous remuneration where excess electricity was purchased at high rates linked to the National Average Power Purchase Price. However, while France and Germany gradually reduced incentives as a function of the RET and the falling cost of solar energy, Pakistan faced a different driver. As higher income consumers offset their consumption, distribution companies' revenue declined while the grid fixed costs were spread among a smaller pool of consumers. Not to mention the financial losses, in the form of penalties, due to underutilization of existing fossil fuel plants under a 'take-pay-model' model. On top of that, grid infrastructure in some areas struggled to handle two-way flows of electricity.

These challenges led to a net billing revision in 2026. Net metering was replaced with net billing, with excess energy purchased at a much lower price than the electricity tariff (11 R/kWh compared to tariffs ranging from 4-50 R/kWh), hence encouraging self-consumption.[51]

Another interesting aspect is that the largest numbers of adopters seem to be high income households, driven by rising electricity costs, as well as low-income farmers, driven by the low reliability of the grid in rural areas and to replace the need for diesel generators, hence reducing annual costs. That being said, some regions, particularly Punjab, aimed to achieve a degree of equity in the residential sector in 2025 by offering free solar modules to households with electricity consumption of fewer than 200 units and 90% rebate for household consuming 200-500 units.[52] It is no surprise then that rooftop solar installation in Punjab represents over 50% of overall rooftop solar energy in Pakistan.

Finally, while Pakistan has a RET of 30%, that target does not seem to be the main driver for the boom in DRE, which was largely spurred by economic and energy security objectives.



[51] BeyondGreen Solar Solutions, 2025, Updated Net Metering Policy Pakistan 2026: What Changed & Is Solar Still Worth It?, BeyondGreen Solar Solutions, https://beyondgreensolar.com/blogs/net-metering-policy-pakistan2026-/
[52] Infolink Consulting, 2024, Solar Energy in Pakistan: A Growing Market, InfoLink Consulting, https://www.infolink-group.com/energy-article/solar-energy-pakistan-Growing-market

4.4 AUSTRALIA (NEW SOUTH WALES)

Australia, particularly the state of New South Wales, is an interesting case of both RET and market-driven incentives with little involvement from the government. Australia is a successful example for implementing distributed solar energy. It currently leads the solar residential market globally, with one in three households with a solar PV system.[53] Concurrently, New South Wales also shows a high degree of inconsistency in the regulations, with various unplanned reactive changes, at least at the beginning, which resulted in several market disruptions.

Incentivizing distributed solar energy began in 2000 by offering rebates for household distributed solar system through the federal government. That was called the Photovoltaics Rebate Program, which was then rebranded to the Solar Homes and Communities Program. The rebate was first, i.e., in 2000, set at 5.5 AUD/W, capped at 8,250 AUD. However, in the same year due to oversubscription the rate was reduced to 5 AUD/W and capped at 7,500 AUD. The rebate was then further reduced to 4 AUD/W and a 4,000 AUD cap, followed by a planned degression of 10 cents to eventually reach 3.5 AUD/W until the end of the program in June 2007. In mid-2007, under a new government, the rebate was increased twofold and the rebate program was extended, which resulted in the PV system size tripling. As expected, however, the program was again oversubscribed and over 65% of users benefiting from the rebate were medium-high- and high-income households. Therefore, in 2008 the government redirected the support scheme only to lower income households with taxable income <100,000 AUD. Despite these efforts, costs overrun caused the program to end abruptly in mid-2009.[54]

The rebate program was replaced in 2011 by two RET-linked, market driven, REC-based incentives: the Small-Scale Renewable Energy Scheme (SRES) for renewable energy with capacities of <100 kW, and the Large-Scale Renewable Energy Target (LRET) for larger system sizes.[55] The federal government legally obliged electricity retailers and energy intensive corporates to meet pre-set RETs through purchasing RECs from the market, or else face penalties. Two types of RECs were sold by the renewable energy generators: Small-Scale Technology Certificates (STC) for systems <100 kW, and Large-Scale Generation Certificates (LGC) for larger systems. STCs are typically bundled and sold in the open market to retailers through installers. The profit is then passed to the user through an upfront discount, estimated based on the expected energy generated (using a government calculator and based on location). LGCs are sold on annual basis by the renewable energy system owner depending on the actual amount of energy generated on that year.[56]

It should be noted that in all cases the additional costs borne by retailers is transferred to the users through extra charges, as is the case in France.

The SRES will run until 2030, coinciding with New South Wales' RET date. Accordingly, the closer to 2030, the lower the energy-use period and hence the number of STC that can be claimed by a user. The STC price is usually fixed when sold through the STC clearing house (although users have the option to sell them in the open market at variable prices).[57] Conversely, LGCs are market driven and the closer the total generated renewable electricity is to the RET (which only applies for the LRET), the lower the LGC price. It should be noted that the LRET has been fixed since 2020 at 33,000 MWh annually and is applicable until 2030.[58]

To further incentivize DRE, in early 2010 New South Wales introduced the FiT under the Solar Bonus Scheme. The FiT was based on gross production and was very generous at the time. It was offered for seven years until end of 2016,[59] with the goal of kick starting the solar market. However, the FiT rate was reduced overnight in Q4 2010 by a third, significantly disrupting the market. The FiT was eventually closed to new applications in Q2 2011. It ended for existing customers at the end of 2016 as initially scheduled.

[53] Australian Bureau of Statistics, 2025, Household solar electricity generation in the Australian national accounts, Australian Bureau of Statistics, https://www.abs.gov.au/articles/household-solar-electricity-generation-australian-national-accounts
[54] Wilkinson, D., Macintosh, A., 2020, The Australian Government's Solar PV Rebate Program, The Australia Institute, https://australiainstitute.org.au/report/the-australian-governments-solar-pv-rebate-program/
[55] Australian Bureau of Statistics, 2025, Household solar electricity generation in the Australian national accounts, Australian Bureau of Statistics, https://www.abs.gov.au/articles/household-solar-electricity-generation-australian-national-accounts
[56] Shand, J., 2026, Solar Rebates in Australia 2026: Ultimate Guide, Solar Choice, https://www.solarchoice.net.au/learn/solar-rebates/
[57] Clean Energy regulator, 2025, Renewable Energy Certificates, Clean Energy Regulator, https://cer.gov.au/schemes/renewable-energy-target
[58] Clean Energy regulator, 2026, Renewable Energy Target, Clean Energy Regulator, https://cer.gov.au/schemes/renewable-energy-target
[59] Skyes, J., 2025, Best NSW Solar Feed-in Tariffs, Solar Choice, https://www.solarchoice.net.au/learn/energy/feed-in-tariffs/best-nsw-fit/

With the Solar Bonus Scheme ending, compensation for exported solar energy was completely left to retailers and was therefore switched to net billing, with the net exported electricity purchased at a rate lower than the electricity tariff. Rates are typically negotiated with the electricity supply contract. Some retailers offer variable purchase rates depending on the time of day, for instance around noon, to avoid purchasing solar electricity when market prices go negative.[60] To ensure there is no negative impact on the network, operators may also cap or dynamically control the renewable exported energy, and in some areas zero export control is required.

Finally, with falling costs of solar energy accompanied by a significant increase in electricity consumption, which doubled between 2009/10 and 2024/25, the government went in the direction of encouraging users towards self-consumption. The federal government has re-introduced incentives, but now for battery storage. Beginning in July 2025, New South Wales provided rebates of 311 AUD/kWh for battery storage application[61] in households and small business. Seeming to have learned from past experience with the solar rebate program, the government has started to apply a semi-annual degression rate, and the program will phase down towards 2030. That incentive was topped up by a state solar battery rebate ranging from 1,600 to 2,400 per battery, but this has now stopped. However, New South Wales does offer interest free loans for solar battery systems for households whose income is under 180,000 AUD.

Table 2: Comparison of International DRE Incentives

	Germany	France	Australia	Pakistan	Egypt
Length of FiT Contract	20 Years	20 Years	no	7 years	no
Support for Low-Income Users?	no	no	Applied previously	yes	no
FiT Scheme	Gross & net billing	Gross & net billing	Net billing only	Net billing only	Net metering Only
FiT Linked to RET?	yes	yes	No (though REC price is linked)	no	no
Government- or Market-Led Incentives?	Government	Government	Market	Government	Government
Consistent Remuneration Policy with Periodic Revision?	yes	yes	High level of inconsistency at the start then market driven	no	no
Source of Remuneration	Federal budget & carbon emissions trading	Electricity consumers indirectly through the energy tax	Electricity consumers	Public budget	Public budget

[60] Sykes, J., 2026, Solar Feed-in Tariffs (FiTs) in Australia: A Homeowner's Guide, Solar Choice, https://www.solarchoice.net.au/learn/energy/feed-in-tariffs/

[61] Batteries with capacities ranging from 100-5 kWh.



4.5 SUCCESS FACTOR

After reviewing the history of incentivizing distributed solar systems in several countries, the following success factors/lessons learned can be deduced:

- Guaranteed purchase of excess energy for a long period, such as 20 years (Germany and France), offers users certainty in their expected return on investment.
- Remuneration should be linked to a specific distributed solar PV system national RET (Germany).
- Two modes of remuneration tailored to user demand, i.e., gross FiT and net billing, tailor the benefit depending on user demand and achieve a soft transition to self-consumption (Germany and France).
- Implement pre-determined degression rates for remuneration, revised semi-annually with the potential of further increase depending on progress towards the RET—as opposed to a sudden or unplanned halt in remuneration which negatively impacts the market (Germany and France).
- Move towards self-consumption and offer incentives for battery storage application (Australia).
- Vary remuneration by system size rather than at a fixed rate (Germany and France).
- Targeting incentives to low-income households guarantees equity in implementing solar systems (Pakistan and Australia).
- State bank initiatives provide concessional loans to partner banks so as to finance distributed solar energy (Pakistan).

5. POLICY RECOMMENDATIONS & ENABLERS

5.1 ACCESS TO FINANCE AND INCENTIVES

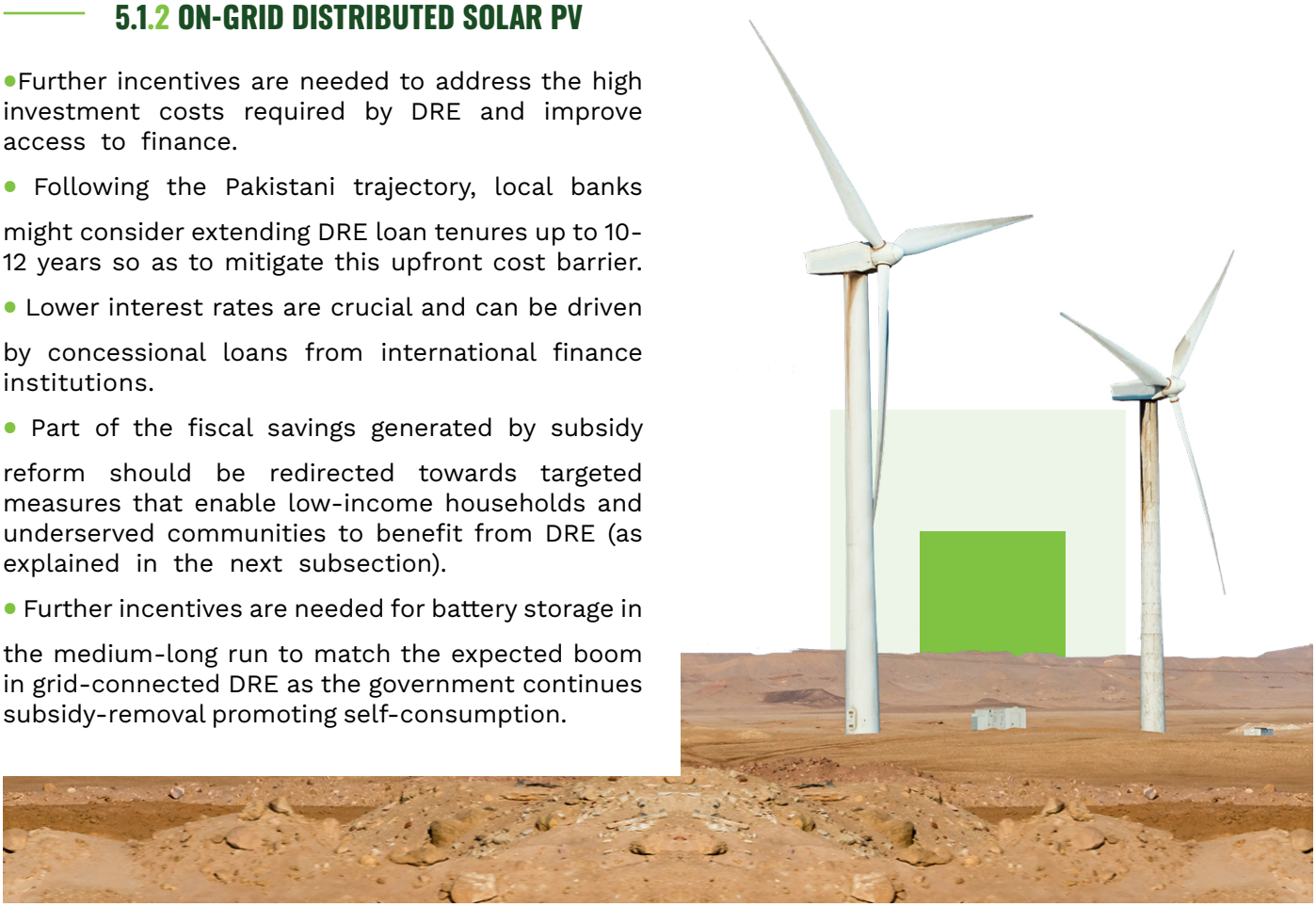
DRE in Egypt is regulated through the constitution, national laws and the electricity regulator (EgyptERA) periodic circulars and grid-connection rules. Laws and regulations are complemented by national strategies.

5.1.1 OFF-GRID SOLAR PV PUMPING

- As revealed by the roundtable discussions, there is currently a lack of sufficient banking incentives to enable farmers to transition to this system. The CBE should therefore introduce dedicated soft loan programs to support this transition, particularly leveraging the ABE to assist farmers in facilitating this process.
- The documentation process required for the loan should be further simplified, especially when it comes to well licensing requirements, without compromising in assessing the environmental risk associated with over-extraction of water.
- More flexible loan repayment terms in cases where seasonal harvest occurs on a semi-annual basis.
- Banks should reduce the debt-to-equity ratio requirements to increase affordability for farmers.
- The government should provide support to cover the credit guarantee costs for solar PV pumping loans.
- Banks should have a whitelist of reliable and bankable solar PV pumping suppliers that they can directly link with their clients.
- Banks should disburse a portion of the loan to suppliers before installation, and the remaining portion after installation—or at least allow the equity portion to be transferred from the bank to the supplier directly.

5.1.2 ON-GRID DISTRIBUTED SOLAR PV

- Further incentives are needed to address the high investment costs required by DRE and improve access to finance.
- Following the Pakistani trajectory, local banks might consider extending DRE loan tenures up to 10-12 years so as to mitigate this upfront cost barrier.
- Lower interest rates are crucial and can be driven by concessional loans from international finance institutions.
- Part of the fiscal savings generated by subsidy reform should be redirected towards targeted measures that enable low-income households and underserved communities to benefit from DRE (as explained in the next subsection).
- Further incentives are needed for battery storage in the medium-long run to match the expected boom in grid-connected DRE as the government continues subsidy-removal promoting self-consumption.



5.2 REGULATORY AND POLICY FRAMEWORKS

- To ensure market stability and guaranteed DRE return, the current net-metering scheme should be through a fixed contract that extends only for seven years, giving users some profit certainty.
- As in Pakistan, there is an expected boom driven by subsidy removal on high income households as well as commercial and industrial users. Solar distributed systems would be crucial to cut annual electricity costs; the regulator should therefore set a cut-off point at which the net-metering scheme could be switched to net billing, promoting self-consumption.
- The cut-off date should be revised on a regular basis, such as every 6 months, and any changes shouldn't affect existing users who are already under contract.
- The gradual phasing out of the tariff subsidy should start with high income consumers, to ensure a level of equity in implementing such incentives.
- To that end, subsidy removal should form part of a progressive and socially equitable reform process rather than an across-the-board withdrawal of electricity support. While gradually reducing subsidies for high-income and high-consumption users could strengthen the economic case for DRE, affordability protections should be maintained for vulnerable households. Where possible, part of the fiscal savings generated by subsidy reform should be redirected towards targeted measures that enable low-income households and underserved communities to benefit from DRE, recognizing that they face barriers beyond electricity tariffs including upfront costs, limited access to finance and unsuitable roof space.
- As in Germany, the government should set a sub-target to the current 2030 RET for rooftop solar systems. Future revisions of Egypt's NDCs must bridge the implementation gap by translating broad policy rhetoric into quantifiable, binding sub-targets for rooftop solar PV (as well as solar-powered irrigation systems).
- As in France, an online map should be developed, showing areas with grid saturation by area/district, to benefit users, suppliers and banks.
- Delineating explicit operational metrics and enforcement timelines for electricity distribution companies will enable the state to leverage global climate finance specifically earmarked for community-level resilience. This approach will ensure that international concessional finance flows directly to small-scale producers, transforming the NDCs' theoretical grid modernization goals into a reality rooted in equity and local sovereignty.

5.3 MARKET DEVELOPMENT AND SUPPLY CHAIN SUPPORT

5.3.1 OFF-GRID SOLAR PV PUMPING

- The government, together with academic institutions and international organizations, should develop maps showing land using modern irrigation techniques and potential land which is either reclaimed or could be converted to use modern irrigation techniques. These maps would be critical for banks and suppliers to better understand market opportunities and target farmers.

5.3.2 ON-GRID DISTRIBUTED SOLAR PV

- A rooftop solar target would be a clear indicator and provide market certainty for users, suppliers and financial institutions.
- Changes to the building code should be implemented to mandate an area of unobstructed roof space for all houses, apartments and industrial buildings.
- Where applicable, industrial buildings should be encouraged to use heavy-weight metal structures suitable for solar PV installations.

5.4 AWARENESS, CIVIL SOCIETY PARTICIPATION AND EQUITABLE ACCESS

5.4.1 OFF-GRID SOLAR PV PUMPING

- The role of civil society should be enhanced by ensuring meaningful participation in solar energy decision-making processes.
- Organizational frameworks to connect solar energy users ought to be established, either through cooperative associations or by creating a system modelled after the WUAs under the Water Resources and Irrigation Law, to empower their participatory role and strengthen community energy governance.
- The government, banks and non-governmental organizations should continue their efforts to increase awareness of the benefits of solar PV pumping applications.

5.4.2 ON-GRID DISTRIBUTED SOLAR PV

- Because affordability protections should be maintained for vulnerable households, it is neither expected, nor advisable, for the government to remove electricity subsidies for low-income households. At the 2021-2026 subsidized tariff levels, individual solar systems may not be financially viable, and moreover many low-income households live in apartments with little unobstructed roof space, further limiting DRE adoption. Therefore, the implementation of semi-decentralized systems is recommended. In the new cities in Egypt, such were systems implemented in low-income housing to offset common loads such as stairwell lighting, paid for by the government and international donors.[62] This model can be expanded to other low-income housing throughout Egypt. As in the Punjab case, such an initiative should contribute strongly to the solar PV systems boom.
- Similar systems would be crucial in rural areas to increase their resilience. In the summer of 2023, the government resorted to rolling blackouts due to extreme heat waves concurrent with the halt of gas import from Israel due to the Gaza war and economic pressure due to high debt and decreased revenue from the Suez Canal. Rural areas were disproportionately affected by those blackouts.[63]



[62] Ministry of Housing, Utilities, and Urban Communities, 2026, The Minister of Housing is overseeing the installation of 37 solar power stations atop residential buildings under the «Housing for All Egyptians» presidential initiative in the city of Hadayek Al-Asima, translated from Arabic, وزارة الاسكان و المرافق و المجتمعات العمرانية | وزيرة الإسكان تتابع تنفيذ ٣٧ محطة طاقة شمسية أعلى عدد من عمارات المبادرة الرئاسية «سكن لكل المصريين» بمدينة حدائق العاصمة

[63] Ayoub, M., 2024, Egypt's Energy Blackouts: A Growing Crisis Amid War, The Tahrir Institute for Middle East Policy, https://timep.org/12/02/2024/egypts-energy-blackouts-a-growing-crisis-amid-war/

5.5 GRID OPERATION & STABILITY

- To address the revenue reduction challenge for distribution companies (and in general the EEHC) caused by increased DRE uptake, it is proposed to increase fixed costs on electricity bills—particularly for high electricity-consuming residential, commercial and industrial users—to cover the cost of maintaining and expanding the grid infrastructure.
- It is also proposed that any reduction in generated electricity needed from existing conventional power plants should be from old plants which are government owned.
- To further address the revenue reduction challenge, integration between various ministries and institutions is crucial. In particular, it is proposed that the revenue from reduced natural gas import bills, caused by increased DRE uptake, should be shared with the MoERE and its affiliated companies.
- Heavy investment in grid infrastructure upgrades and reinforcement by both the EETC and distribution companies is strongly advised.
- Given the scale of investment needed, concessional finance from international finance institutions and donors would be essential.
- The implementation of microgrids should be considered as an alternative to upgrading or extending grid infrastructure, particularly in remote desert areas.



Table 3: Summary of recommendations for on-grid DRE

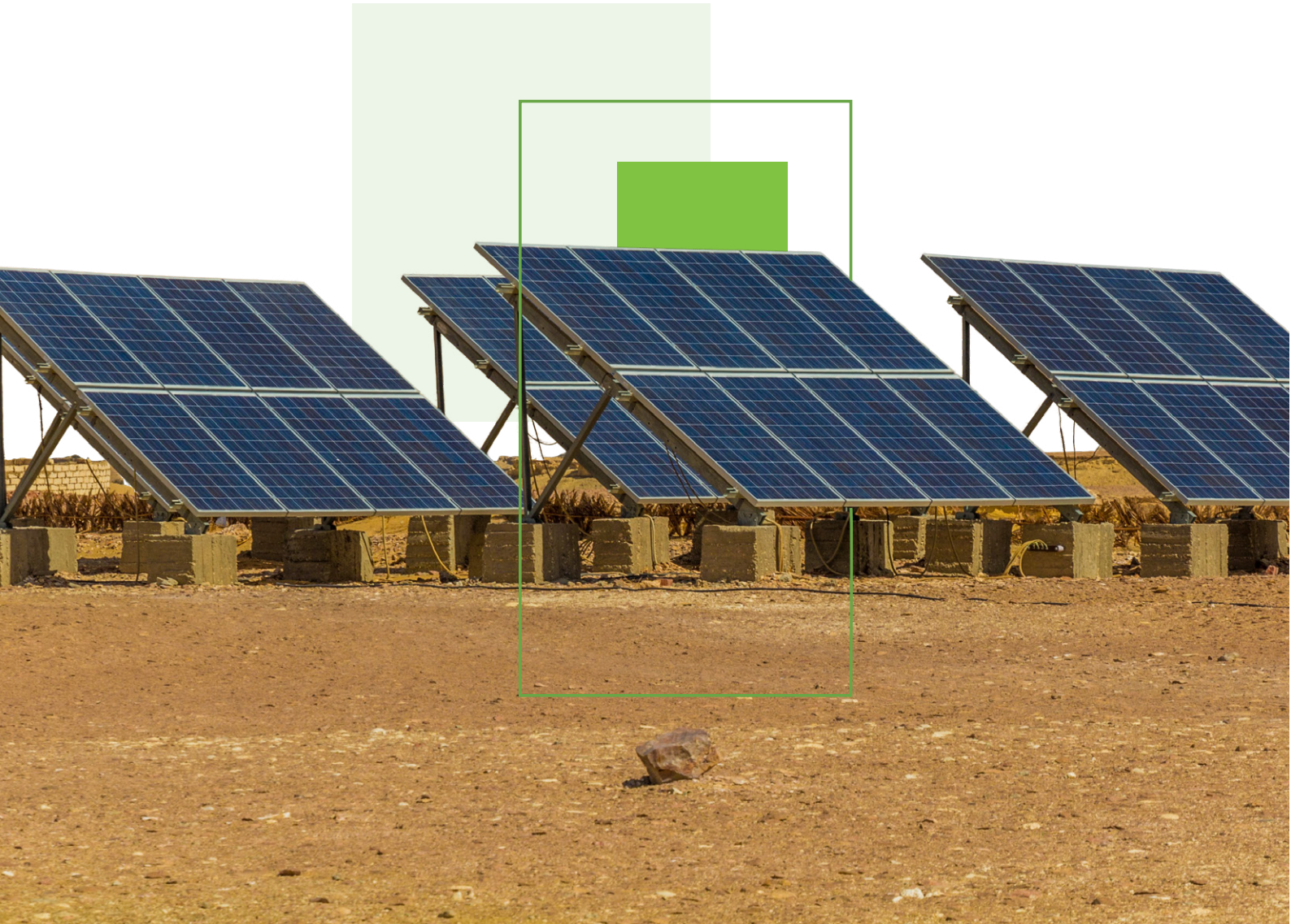
Recommendation	Target Stakeholders
Gradual removal of subsidies from high-income users. The additional revenue could be used to support DRE for low-income households and farmers.	Ministry of Electricity and Renewable Energy /EgyptERA
Net-metering to be under a seven-year contract to provide certainty for users.	EgyptERA
Net-metering to be revised on a semi-annual basis and to be phased out starting with high-income new users to avoid unnecessary financial burden on the government resulting in subsequent sudden market-disrupting decisions.	EgyptERA
Offering free semi-centralized PV systems to low-income households to offset the shared load. Similar systems to be offered in rural areas to increase population resilience.	New Urban Communities Authority, Ministry of Housing, Utilities, and Urban Communities, Governorates
Set a sub-target dedicated to rooftop solar PV systems, offering certainty in market demand. Update current national strategies accordingly	MoERE
Increase fixed electricity costs for high-income users to offset any revenue drop experienced by distribution companies and EEHC as a whole.	Ministry of Electricity and Renewable Energy /EgyptERA
Implement concessional loans for DRE, and in some cases grants particularly for low-income households and for semi-decentralized DRE.	Local banks, International finance institutions and donors, CBE
Heavy investment in grid infrastructure upgrades and reinforcement, relying on international concessional finance.	EETC, Ministry of Finance, distribution companies, and climate finance funds
Further reliance on microgrids in remote areas.	MoERE, EgyptERA, distribution companies
Develop an online map showing areas with grid saturation by area/district for transparency purposes and demand certainty.	Distribution companies
Change the building code to mandate a certain area of unobstructed roof space.	Housing & Building National Research Centre, Industrial Development Association

CONCLUSION

Egypt has the solar resources, legal foundations and technical capacity to expand DRE significantly. Yet, its potential will remain underused unless the country closes the gap between national policy commitments and on-the-ground implementation. Utility-scale renewable energy remains essential to meeting national capacity targets, but it cannot on its own deliver an energy transition that is accessible, resilient and responsive to the needs of households, farmers, small businesses and local communities.

The February 2026 multi-stakeholder roundtable demonstrated both the demand for decentralized solutions and the importance of developing them through dialogue with the people and institutions directly affected. Participants' contributions showed that DRE can reduce irrigation and production costs, strengthen energy autonomy and protect livelihoods from fossil fuel price volatility. They also made clear that finance, grid access, institutional coordination and meaningful community participation will determine whether these benefits can be achieved at scale.

DRE must therefore form part of a broader just energy transition away from fossil fuel dependence. This means assessing success not only through the amount of renewable capacity installed, but also through who can access it, who controls it and how its benefits are distributed. A just approach must protect vulnerable households during subsidy reform, enable farmers and small producers to overcome high upfront costs, strengthen local participation in energy decision-making, and direct public and international finance towards communities that commercial financing is least likely to reach.



Achieving this will require a coordinated policy package. Long-term and predictable net metering contracts should provide market certainty, while measurable rooftop-solar and solar-irrigation targets should embed DRE within national energy strategies and future NDCs. Concessional finance, longer loan tenures, credit guarantees and targeted grants should make investment possible for farmers, small businesses and underserved communities. Semi-decentralized systems should be expanded in social housing and rural areas, while cooperatives and WUAs should be empowered to support collective access and participatory energy governance.

These measures must be supported by transparent information on grid capacity, significant investment in distribution networks and storage, and greater use of microgrids where conventional grid expansion is inefficient. Stronger coordination among ministries, regulators, distribution companies, financial institutions and civil society will also be necessary to overcome fragmentation. International climate finance has an important role to play, particularly through concessional and grant-based resources that support grid modernization and equitable access without creating additional debt burdens.

By implementing these reforms as an integrated package, Egypt can move DRE from the margins of energy policy to the center of a just, resilient and people-centered energy transition. This will help reduce dependence on imported fossil fuels, strengthen national energy sovereignty and economic resilience, create opportunities for local value creation, and ensure that farmers, households and small producers are not merely affected by the transition, but are active participants in and beneficiaries of it.



APPENDIX I

Quarter 2 Values	2021	2022	2023	2024	2025	2026
Agriculture LV (EGP)	0.95	0.95	0.95	1.1	2	2.65
Agriculture LV (USD)	0.061	0.051	0.031	0.023	0.040	0.052
Industrial LV EGP	1.25	1.25	1.25	1.5	2.34	2.74
Industrial LV USD	0.080	0.068	0.041	0.032	0.046	0.054
Commercial						
CAT 1 (0-100 kWh) EGP	0.65	0.65	0.65	0.65	0.85	1.62
CAT 2 (0-250 kWh) EGP	1.2	1.2	1.2	1.36	1.68	2.16
CAT 3 (0-600 kWh) EGP	1.4	1.4	1.4	1.5	2.2	2.64
CAT 4 (601-1000 kWh) EGP	1.55	1.55	1.55	1.65	2.27	2.74
CAT 5 (0 - >1000 kWh) EGP	1.6	1.6	1.6	1.8	2.33	2.79
CAT 1 (0-100 kWh) USD	0.041	0.035	0.021	0.014	0.017	0.032
CAT 2 (0-250 kWh) USD	0.076	0.065	0.039	0.029	0.033	0.042
CAT 3 (0-600 kWh) USD	0.089	0.076	0.046	0.032	0.044	0.052
CAT 4 (601-1000 kWh) USD	0.099	0.084	0.050	0.035	0.045	0.054
CAT 5 (0 - >1000 kWh) USD	0.102	0.086	0.052	0.038	0.046	0.055
Residential						
CAT 1 (0-50 kWh) EGP	0.48	0.48	0.48	0.58	0.68	0.68
CAT 2 (51-100 kWh) EGP	0.58	0.58	0.58	0.68	0.78	0.78
CAT 3 (0-200 kWh) EGP	0.77	0.77	0.77	0.83	0.95	0.95
CAT 4 (201-350 kWh) EGP	1.06	1.06	1.06	1.25	1.55	1.55
CAT 5 (351-650 kWh) EGP	1.28	1.28	1.28	1.4	1.95	1.95
CAT 6 (0-1000 kWh) EGP	1.28	1.28	1.28	1.5	2.1	2.1
CAT 7 (0->1000) EGP	1.45	1.45	1.45	1.65	2.23	2.58
CAT 1 (0-50 kWh) EGP	0.031	0.026	0.016	0.012	0.013	0.013
CAT 2 (51-100 kWh) EGP	0.037	0.031	0.019	0.014	0.015	0.015
CAT 3 (0-200 kWh) EGP	0.049	0.042	0.025	0.017	0.019	0.019
CAT 4 (201-350 kWh) EGP	0.068	0.057	0.035	0.026	0.031	0.030
CAT 5 (351-650 kWh) EGP	0.082	0.069	0.042	0.029	0.039	0.038
CAT 6 (0-1000 kWh) EGP	0.082	0.069	0.042	0.032	0.042	0.041
CAT 7 (0->1000) EGP	0.092	0.078	0.047	0.035	0.044	0.051

