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Towards a Transformative Reconstruction of the Electricity Sector in Syria

Current Developments and Opportunities

Sultan Jalabi

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Abstract

This discussion paper examines the development of Syria's electricity sector before and since the fall of the Assad regime in December 2024. It also assesses what this implies for the post-war reconstruction of the electricity sector. Drawing on field research conducted in Damascus and Qamishli between August and December 2025, and using a theoretical framework that prioritises environmental sustainability and social inclusion, this paper explores opportunities and challenges for pursuing a transformative reconstruction of the electricity sector that is environmentally sustainable (prioritising renewables) and socially inclusive (participatory and affordable).

The paper finds that fragmentation is a key characteristic of the energy regime in post-war Syria, materialising in recent years in three isolated electricity systems: an off-grid, generator-based system in the north-east; a Turkey-linked, semi-private supply system in the north-west; and a national-grid system in the rest of the country. Further findings highlight that the transitional government prioritised the rapid restoration of centralised, fossil fuel-based power plants over renewable energy. It restructured electricity-related public institutions according to market rules and further privatised the electricity market to attract investors, raising electricity tariffs significantly, even as 90 per cent of Syrian households live in poverty.

The paper concludes that the ongoing reconstruction pathway is a state-led, market-driven and socially insensitive model. International development cooperation can help local actors bridge this gap at the legal, administrative and technical levels. At the legal and administrative levels, international development cooperation can support local efforts to develop an inclusive electricity-governance framework. To date, electricity-related rules have changed rapidly under the transitional government's top-down approach, with little transparency or community participation.

At the technical level, shifting from standalone, off-grid solar systems to connected hybrid and mini-grid systems requires a targeted programme. This is an area for collaboration between the transitional government and international development cooperation. Nevertheless, closing the information gap in the electricity sector is still a key challenge for policy planning.

Keywords: Conflict, Transformative Reconstruction, Electricity, Climate Change, Sustainability, Institutional Reform

Contents

Abbreviations

AANES	Autonomous Administration of North and East Syria
HTS	Hay’at Tahrir al-Sham
kWh	kilowatt-hour
MENA	Middle East and North Africa
MW	megawatt
NGO	non-governmental organisation
P2P	peer-to-peer trading
SDF	Syrian Democratic Forces
STT	socio-technical transitions
UNDP	United Nations Development Programme

1 Introduction

Over the last decade, the literature on electricity in Syria has consistently centred on the destruction of infrastructure (Aoun, 2022), the collapse of generation capacity (Hatahet & Shaar, 2021) and the societal implications of the acute shortage of electricity (United Nations Office for the Coordination of Humanitarian Affairs, 2023). Syria has emerged from the war with severely degraded energy infrastructure, only to confront the worst drought the country has experienced in five decades (Notre Dame Global Adaptation Initiative, 2025; Shaar, 2025b). Caught between these overlapping crises, the fragile state faces hard questions about reconstructing the electricity sector in post-war Syria.

In 2021, the former Syrian Ministry of Electricity estimated the cost of repairing damaged centralised power plants and the national grid at USD 2.4 billion (Hatahet & Shaar, 2021). However, given that most of these power plants are fossil fuel-based, it is questionable whether such an investment is justified in light of the global energy transition towards renewables. This discussion paper argues that, in the era of climate change, Syria's electricity reconstruction should not merely aim to restore pre-war systems but should instead become a transformative process that leads to an environmentally sustainable, affordable and participatory electricity supply. Nevertheless, the paper identifies major advances in renewable-energy technologies and their cost effectiveness (Philipps, Fraunhofer ISE, & Warmuth, 2023), which enabled "Syria's Surprising Solar Boom" (Hubbard & Prickett, 2021), as a potential transformative window of opportunity, providing alternative pathways for reconstructing the electricity sector.

Against this background, the paper examines critical developments in the electricity sector since the fall of the Assad regime in December 2024. It identifies the key characteristics of the transitional government's ongoing reconstruction approach. Moreover, it provides an assessment of technical options and political frameworks, focusing on the interdependence between choices made in the technical reconstruction of the sector and their political implications. The aim is to generate policy-relevant insights for enhancing the transformativity of the ongoing reconstruction of the electricity sector in Syria. The paper addresses four research questions:

1. What are the key characteristics of the electricity landscape in post-war Syria, including sources, actors and governance frameworks?

2. What are the critical developments in the electricity sector since the fall of the Assad regime, and what do they tell us about the new government's strategies and goals for the electricity sector?

3. What are the opportunities and risks associated with promoting renewable energy to achieve a transformative reconstruction of the electricity sector that is environmentally sustainable, affordable and participatory?

4. Where can international development cooperation contribute to ongoing developments in Syria's electricity sector to make reconstruction as transformative as possible?

Following this introduction, Section 2 reviews the most relevant literature and sets out the analytical framework. Section 3 presents the data collection and methodology, while Section 4 delves into the findings. Section 5 then elaborates on the electricity landscape in different parts of the country. It analyses ongoing developments in the electricity sector at the administrative, economic and societal levels and considers decentralised renewable-energy systems as a promising means of enhancing the transformativity of ongoing reconstruction processes. Section 6 presents the conclusions and provides brief answers to the aforementioned research questions. Section 7 offers recommendations and key messages for local authorities and German development cooperation.

2 Literature and analytical framework

This paper draws on three domains of literature: (i) the literature on clean energy that focuses on technical solutions and the experiences of other countries that are relevant to Syria; (ii) the post-conflict reconstruction literature that prioritises peace-building; and (iii) the sustainability-transformation literature, especially the socio-technical transitions (STT) framework, which prioritises climate change adaptation as a multi-level process. Combining the three domains of literature provides a better framework for analysing Syria's transition, at both the technical and political levels.

The "clean energy revolution" literature informs the study's analytical framework by identifying potential renewable-energy pathways for Syria. It shows that during the last two decades, technological progress has made solar electricity generation cheaper, more efficient and widely accessible (Philipps et al., 2023). The prices of photovoltaic (PV) modules fell by 81 per cent between 2009 and 2017 (IRENA, 2018), while solar PV capacity has grown faster than fossil-fuel generation capacity (Secretariat of the Global Commission & Van de Graaf, 2019). For many countries with destroyed or incapacitated infrastructure, renewable-energy mini-grids have the potential to be a game changer and challenge the centralised energy regime. They have demonstrated an ability to provide electricity services at a significantly lower cost than either grid extensions or stand-alone energy systems (González-García et al., 2022). These models are broadly applied in the MENA region, sub-Saharan Africa and Southeast Asia (Lefore, Closas, & Schmitter, 2021; Mandelli, Barbieri, Mereu, & Colombo, 2016), offering a potential solution to energy poverty.

Contemporary scholarship on post-conflict reconstruction agrees that reconstruction should explicitly avoid restoring prior conditions and reproducing the power and social structures that created the conflict (Opitz-Stapleton, Gulati, Laville, Vazquez, & Tanner, 2023). Instead, there should be "a long-term, transformative process that contributes to inclusive, sustainable development and peacebuilding" (Hopp-Nishanka, 2021). Transformation, according to Pelling, O'Brien and Matyas (2015), is an adaptive response to climate change, whereby "trans-formativity" describes the depth of change, not its origin, breadth or trajectory. Adaptation, however, is a political decision that involves a fundamental shift in existing systems and actions that lie beyond the limits of incremental changes (Dow, Berkhout, & Preston, 2013). A key topic in this domain of literature concerns reconstruction models. Alayasa and Nemec (2025) analyse several post-conflict reconstruction experiences, differentiating between two models: the "liberal model", which prioritises security and economic growth, and the "sustainable development model", which focuses on reducing vulnerabilities and increasing levels of social inclusion. They argue that Rwanda's sustainable development model has shown more promise for lasting peace and just development than the liberal model, which often fails in places such as Iraq, Afghanistan and Lebanon and produces more violence and corruption. Several international reports view Rwanda as a successful example of post-war recovery (World Bank, 2019), although it is continually criticised for being an autocracy.

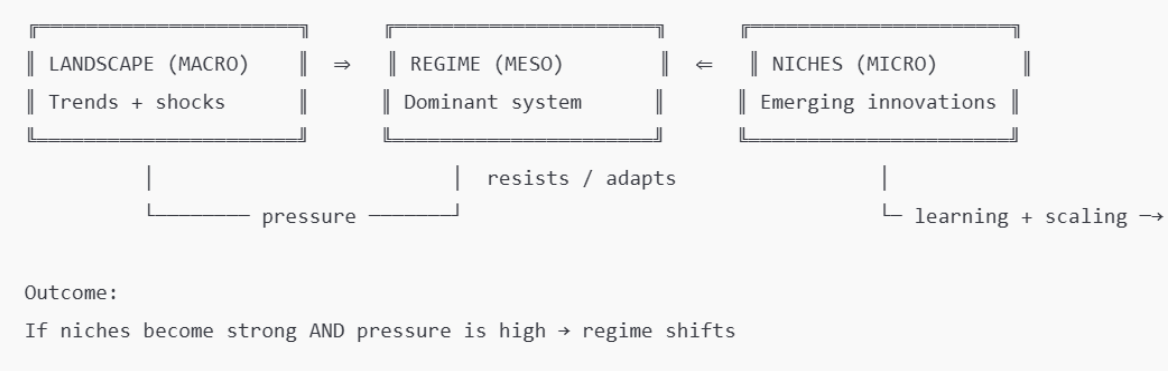
Bringing together conflict, climate adaptation and reconstruction allows for a clearer conceptu-alisation of the transformative reconstruction needed for Syria's electricity sector. Achieving a transformative reconstruction requires changing the infrastructure, rules and institutions so that reconstruction is socially inclusive and environmentally sustainable. Social inclusivity in this context is reflected in the affordability of the service cost (e.g. electricity prices) and the ability of small-scale electricity producers to participate in the electricity market.

This analysis draws on these three domains of literature to analyse the transformative reconstruction of the electricity sector in Syria from a multi-level perspective. This approach builds on Geels' STT framework (Geels, 2002, 2004, 2011), which conceptualises the transition from unsustainable to sustainable energy systems as a socio-technical process occurring at

different levels, and thus requires a multi-level analysis. The framework conceptualises transitions as the result of interactions between three distinct levels: The macro-level landscape includes the deep structural trends that form the context for the other two levels; the meso-level regime is the dominant energy system; and at the micro level, niches and innovations form alternatives to the dominant regime (Geels, 2011); these alternatives may be technical, administrative or political (Markard, Raven, & Truffer, 2012).

Within the theory, prolonged conflict acts as a landscape shock that fundamentally destabilises the existing energy regime (Geels, 2002). The literature also suggests that post-war recovery provides an opportunity to bypass outdated systems in favour of more sustainable ones (Skrimizea et al., 2020).

Figure 1: Multi-level perspective on socio-technical transitions (STT)



Source: Author's visualisation based on Geels (2002)

Applied to Syria's case, the dominant energy regime (meso level) still comprises the state-owned centralised power plants and the national grid. The macro-level landscape is shaped by the global shift towards clean energy and the conflict, which is viewed as a landscape shock that has destabilised the existing energy regime. At the micro level, niches are emerging – such as the unregulated "solar boom" on the household and commercial levels – that have accumulated off-grid generation capacity approaching that of the national grid. Within the STT framework, these niches become consequential when they accumulate sufficient technical reliability, social legitimacy and organisational capacity to scale beyond local experimentation. In this regard, the literature suggests that scaling up these alternatives requires more than technical uptake; it requires navigating a complex landscape of new actors, business models and regulatory frameworks (Lefore et al., 2021). To scale up the niches, Geels (2002) suggests that pressure from landscape-level factors, such as the global energy transition and climate adaptation commitments (macro), on the energy regime (meso) has the ability to strengthen niches (micro).

Empirical evidence from Syria's electricity sector further reinforces the theoretical case for transformative change. Climate change is expected to exacerbate conflicts in Syria and similar MENA contexts (Kayed et al., 2025). A transformative reconstruction model is therefore a necessity, not only for the environment but also for long-term social stability. Among these models, decentralised renewable-energy systems are among the most promising technical solutions (González-García et al., 2022). They have also been shown to reduce the risks of renewed violence (Edwards, 2018) and improve local resilience (Lentschig, Mozersky, D'Amico, van Schaik, & Tang, 2024).

Building on this background, this research seeks to synthesise these theoretical lessons with empirical evidence from Syria. It applies the STT framework to explore, analyse and contribute

to the debate around the reconstruction model of post-conflict Syria. The framework guides the investigation and analysis, covering both the technical and political aspects of Syria's electricity sector, and enables a systematic understanding of its ongoing developments. It also serves to identify opportunities for alternative reconstruction pathways towards an ecologically sustainable and socially inclusive energy regime for Syria.

3 Methodology

This study applies a qualitative research design combining semi-structured interviews, field observations, and an expert workshop to analyse electricity governance and market formation in post-conflict Syria.

Empirical work was centred on two contrasting field sites – Qamishli and Damascus – to capture differences in institutional authority, service provision arrangements and the evolving policy agenda. Data collection extended from August to December 2025. It relied primarily on interviews conducted with 10 informants in both cities (Annex 1) as well as an expert workshop, which was organised in Damascus in December 2025 (Annex 2). Five interviews were conducted in Qamishli, including local administrators and private-sector actors; four interviews were held in Damascus and included representatives of the Ministry of Energy and technical experts. One interview was conducted remotely with an independent expert who lives in Aleppo. Interviews were coded to protect participants' privacy and are cited accordingly.

In Qamishli, the research combined interviews with structured field observations to document how electricity is provided and governed, with particular attention paid to diesel generator networks and informal distribution systems. These observations were used to verify and contextualise interviewees' accounts of governance gaps, technical standards and service availability. In Damascus, interviews focused on policy and institutional reforms in the electricity sector, including tariff changes, the restructuring of public entities, plans for an independent regulator and private-sector entry.

Findings were complemented and validated through an expert workshop in Damascus. The purpose of the workshop was to explore potential transformative pathways for the reconstruction of the electricity sector. After presenting the preliminary findings of the research and its analytical approach (the multi-level STT framework), 10 experts took part in two discussion sessions assessing the key technical and political developments in the sector, as well as opportunities and challenges for reinforcing the transformativity of the reconstruction. Participants came from various backgrounds, including government, academia, local non-governmental organisations (NGOs), independent research institutions and a representative of the United Nations Development Programme (UNDP).

In the following sections, the paper first maps Syria's fragmented post-war energy regime and compares the country's three disconnected subnational grids, focusing on technical conditions, governance arrangements and the pricing logic of each sub-grid. The analysis then shifts to the technical and political transitions now under way, focusing on how top-down institutional restructuring is laying the groundwork for an emerging electricity market, and how this market-making intersects with major investment and contracting practices. Next, it examines how electricity in Syria is shifting "from a right to a commodity" and the resulting tensions in a context of widespread poverty. Finally, the paper assesses the prospects of renewable-energy systems, especially the rapid expansion of solar systems among households and workplaces. Using the STT framework, the paper conceptualises them as niches that emerge at the micro level and can reshape the dominant energy regime at the macro level.

4 Making sense of the fragmented energy regime

This section analyses the fragmented energy regime in post-war Syria. A meso-level analysis following the STT framework (Geels, 2011) shows that the long political and administrative fragmentation since 2012 has left three separate energy sub-regimes, mirroring the political fragmentation: the national grid in areas formerly controlled by the Assad regime; the Turkey-connected sub-grid in the opposition-controlled areas in the north, including Hay'at Tahrir al-Sham (HTS); and the sub-grid in the Syrian Democratic Forces (SDF) region in the north-east of Syria. Each region has operated its own generation and distribution infrastructure, regulations, administrative bodies and pricing policies.

Although these energy sub-regimes have gradually moved towards integration since the fall of the Assad regime, it is important to understand each case, given its implications for the country's future energy security and system-wide integration. The sections below outline and summarise the technical and political aspects of each of the three energy sub-regimes (see Table 1).

4.1 The national grid: under revival

The following analysis of the national grid focuses on the technical and political levels. At the technical level, it shows the state of infrastructure, the generation gap, and the governmental and foreign interventions to revive the system. At the political level, it illustrates the shift of the state's role from the provision of electricity to the management of the electricity market.

4.1.1 Technical assessment

Syria was once a leading energy producer within the region before the outbreak of the civil war in 2011 (Alhaj Omar, Mahmoud, & Cedano, 2023). The national grid, which covered nearly 95 per cent of the country, was interconnected with those of Turkey, Jordan, Lebanon and Iraq until 2011. During that period, Syria exported electricity to Lebanon and Jordan while importing it from Turkey. The national grid was fed by 18 major centralised power plants – three of which were hydroelectric, with the remainder powered by fossil fuels, including seven oil-fired plants and eight gas-fired plants. The on-grid contribution of renewable energy accounted for only about 5 per cent of total electricity generation capacity, most of it provided by dams on the Euphrates River (Saifan, 2025).

The conflict has drastically reduced electricity generation and distribution capacity. Three key power plants were destroyed: Aleppo Thermal Power Plant in 2015, Zayzoun Power Plant in Idlib in 2016 and al-Taim Power Plant in Deir-ez-Zor in 2017 (Hatahet & Sha'ar, 2021). More than 70 per cent of power plants and transmission lines were damaged, cutting the national grid's capacity by more than 75 per cent (UNDP, 2025). According to the World Bank (2017), electricity generation fell from 43 terawatt-hours in 2010 to 16 terawatt-hours in 2015. Oil production also dropped dramatically, from 333,000 barrels per day in 2011 to just 32,000 in 2022 (CEIC, 2022). Electricity was consistently cited as the third-highest priority, after food and livelihoods (UNDP, 2022), and was also identified as the most significant challenge by 68 per cent of local firms (Salmon, Assaf, & Francis, 2018).

Since the fall of the Assad regime, the newly established Ministry of Energy has focused on rehabilitating major power plants and restoring transmission lines (SyriaNow, 2025). This effort was supported by the World Bank, which provided a grant of USD 146 million to improve electricity infrastructure rehabilitation (World Bank, 2025a). In parallel, it has intensified efforts to secure the fuel required to operate the power plants, following the cessation of Iranian supplies after the fall of the Assad government (Ibrahim, Karazi, al-Mahmoud, & al-Khouja, 2025). Syria is now heavily reliant on Russian oil (Raydan, 2025). Meanwhile, the transitional

government enjoys Qatari and Turkish support, particularly through the provision of natural gas – initially from Qatar, then Jordan via the Arab Gas Pipeline, as well as from Azerbaijan via Turkey (SOCAR Türkiye, 2025).

As a result, electricity generation in Syria increased within one year from approximately 1,600 megawatts (MW) (Shaar, 2025a) to around 2,250 MW in 2025 and to nearly 3,000 MW in April 2026, according to the Ministry of Energy. The ministry further maintains that the combined installed generation capacity of existing power plants could reach up to 4,500 MW if fuel supplies were sufficient, including gas (SyriaNow, 2025). Independent experts estimate national grid demand to range between 5,000 and 7,000 MW, with expectations that this figure will continue to rise as displaced populations return and economic activities resume (Interview, DA1, 2025).

4.1.2 Political assessment

Until 2010, Syria's electricity sector was a state monopoly. This changed with the adoption of Electricity Law No. 32, which opened the electricity sector to private investment for the first time. However, less than a year after the law's enactment, nationwide protests erupted and the newly opened space failed to attract any significant private investment. Later, the international sanctions imposed on the Assad regime throughout the conflict further obstructed the emergence of a domestic energy market, leaving public institutions as the sole actors in the sector.

After the fall of the Assad regime, Syria's political and economic isolation began to diminish; the new authorities in Damascus received direct support from Gulf countries and Turkey, followed by Western backing, which materialised in the gradual easing and eventual lifting of sanctions in early December 2025 (Shaar, 2025a). For the transitional government, the energy sector is a driver of the national economy, as it has the potential to significantly increase oil, gas and electricity production and generate government revenue (Shaffer, 2025). However, significant developments have taken place in the state-run electricity sector since the transitional government took office, involving technical, administrative and market dimensions (Section 5).

There are two energy sub-regimes that coexist with the national grid: The SDF-affiliated Energy Authority operates a sub-grid with limited electricity supply, while in the north, three private companies are importing electricity from Turkey to supply the sub-grid in Idlib and rural Aleppo. The following paragraphs elaborate on each of these subnational systems.

4.2 The north-east: rich in oil, poor in electricity

North-east Syria has a poorly performing electricity system that is characterised by a severe generation-capacity deficit, a reliance on diesel generators and limited regulatory capacity. Politically, the ongoing reintegration of the region into the national system is reshaping the future of the region's electricity system.

4.2.1 Technical assessment

Until January 2026, the SDF controlled nearly a third of the country's land, extending from the Euphrates River east to where Syria's border intersects with those of Turkey and Iraq. The region contains most of Syria's oil and gas resources, but it lacks adequate infrastructure for electricity generation and oil refining. It hosts only three electricity generation facilities. The first electricity-generation facility comprises three dams on the Euphrates River (Tishrin, al-Thawra, al-Baath). According to the Energy Authority in north-east Syria, by September 2025, Euphrates dams were operating at only 10 per cent of their generating capacity due to technical problems and low water levels, generating approximately 80 to 120 MW. The second electricity-generation

facility is the Sweidiya power plant, a gas-turbine station located east of Qamishli, which produces around 8 to 14 MW – nearly 10 per cent of its full capacity, according to the same authority. This plant was subjected to Turkish airstrikes in early 2024, putting it out of service for several months. The Energy Authority explained: “The plant was already dilapidated and operating beyond its intended lifespan, but the Turkish bombardment forced us to spend three months transferring components from one turbine to another to operate three out of ten turbines” (Interview, NE1, 2025). The third electricity-generation facility is the Jibsa power station, located south of al-Hasakah city. This plant was looted when ISIS controlled the area (2014-2017), and by October 2025 it was producing less than 10 MW (Interview, NE1, 2025).

Together, the three facilities generate approximately 100 to 140 MW, while the Energy Authority estimates that the region’s electricity demand is approximately 1,340 MW. This implies a generation–demand gap of around 90 per cent. This shortfall is addressed primarily through small, private diesel generators connected to informal mini-grids across cities and towns, alongside an unregulated, growing reliance on stand-alone solar systems by households and businesses (Sadik-Zada & Jalabi, 2025). The Energy Authority was unable to effectively address the generation-capacity shortfall, as it lacks the financial and logistical resources required to import technology and infrastructure components necessary to rehabilitate gas-fired and hydropower plants (Interview, NE1, 2025). However, at the time of data collection, the authority was piloting a prepaid electricity-distribution system for the existing supply in ar-Raqqa and some small towns of al-Hasakah.

By late January 2026, the transitional government took control of two of the three governorates that were previously controlled by the SDF, including the three dams in ar-Raqqa and major oil and gas fields such as al-Omar in Deir-ez-Zor and Jibsa in al-Hasakah. At the time of writing this report (June 2026), the SDF’s only remaining energy resources were the Rmeilan oil field east of Qamishli city, and the Sweidiya gas field and its electricity generation facility.

4.2.2 Political assessment

Over 14 years, the Democratic Union Party (PYD) – with roots in the Kurdistan Workers’ Party (PKK) – developed its own governance model in north-east Syria, which materialised in the Autonomous Administration of North and East Syria (AANES) and its military arm, the SDF (Shaffer, 2025). Although the party established a broad structure of authorities as well as civil and military institutions, at least formally, decision-making remained exclusively with a core group of party members, most of them former members of the PKK. These members usually have no official or institutional titles, but they oversee all AANES bodies (Interview, NE5, 2025). Over time, this dual leadership resulted in inefficient, non-transparent and exclusive institutional structures. The first electricity law in the north-east was introduced in 2024, known as Law No. 9, even though it appears to be largely modelled on Syria’s Electricity Law No. 32 of 2010. Beyond this, no regulatory frameworks were identified to govern the rise of renewable energy, the operation of diesel generators or investment in the electricity market.

Although the Energy Authority in north-east Syria oversees the oil and electricity sectors, it does not regulate electricity produced by diesel generators. The responsibility for the latter is instead delegated to municipalities, leaving the authority institutionally isolated from a significant portion of the electricity market. In the city of Qamishli, for example, 650 diesel generators are licensed by the municipality (Interview, NE2, 2025). These generators constitute the primary source of electricity in a city where grid-based electricity services were entirely unavailable for the last two years (2024-2025) (Interview, NE3, 2025). Diesel generators are present in almost all neighbourhoods of the city (Interview, NE3, 2025) and are typically installed in public spaces, including parks and sidewalks, schools and public institutions, often in proximity to residential areas. Most of these generators are outdated, with many exceeding 50 years of age (Interview, NE4, 2025). Each generator consumes between 30 and 40 litres of diesel per hour. The situation

is further exacerbated by the poor quality of the diesel fuel, which is produced in rudimentary local refineries.

As a result, the city remains persistently enveloped in a dense cloud of toxic emissions, in addition to severe noise and visual pollution, thereby posing tangible environmental and public health risks to both natural and urban systems (Alosh, 2026). Similar conditions were observed in other cities across the region, including al-Hasakah and Amuda. At street level, each generator owner deploys a parallel distribution network (informal mini-grid) using the poles and cables of the national grid, with each generator supplying electricity to approximately 200 households; consequently, around 650 informal mini-grids are attached to the national grid's infrastructure in a disorderly and often unsafe manner, at times forming what resembles a dense web of intertwined cables. The absence of regulatory legislation has led to frequent disputes between generator operators and citizens as end users. In many cases, municipalities are unable to protect citizens from generator operators, whose number in Qamishli alone is estimated at approximately 1,200, organised under a "Generator Owners' Union", giving them leverage over municipal authorities (Interview, NE4, 2025).

Over the years, AANES was unable to ensure a stable electricity supply in the region, and after losing control of the dams on the Euphrates River to the government in early 2026 – a strategic source of electricity – the region's electricity situation deteriorated further. According to the new agreement between the SDF and the Syrian transitional government, the remaining AANES-controlled areas, institutions and energy infrastructure will be gradually integrated into the government and the national grid. Accordingly, cities in the north-east will have to be reconnected to the national grid.

4.3 North-west Syria: a semi-privatised electricity sector and integration into the Turkish energy market

North-west Syria has developed a semi-privatised electricity system that is centred on imports from Turkey and governed by private operators rather than public institutions. Although this model achieved near-continuous electricity supply and stimulated investment in local solar systems, it remains characterised by high tariffs, weak regulation, opaque governance arrangements and increasing integration with the Turkish energy market rather than the Syrian national grid.

4.3.1 Technical assessment

Electricity supplies to Idlib and northern Aleppo Governorates began to decline in 2013 as opposition control expanded. The region contained a thermal power plant with a generation capacity of 500 MW, but it was destroyed by the Assad regime's air force in 2015 (Enab Baladi, 2016). The facility was later dismantled and sold as scrap by factions affiliated with HTS. The region was then completely disconnected from the national grid, forcing millions of residents to rely on diesel generators as their sole electricity source for the next five years.

Noise and emission levels from diesel generators began to decline gradually following the start of electricity imports from Turkey. In northern Aleppo, two companies registered in Turkey signed contracts with the Turkish Ministry of Energy to import electricity. AK Energy supplies most of the border strip in areas extending from the city of Azaz in the west to Ras al-Ayn in the east, with the exception of the Afrin region, which is supplied by STE, another Syrian-Turkish company (Interview, NW1, 2025). Operating independently, both companies undertook the rehabilitation of the public electricity infrastructure in their respective areas and connected them to the Turkish grid via medium-voltage transmission lines. The companies also equipped households with smart prepayment metres, while commercial and industrial users operate under

postpaid billing systems. Together, the two companies import approximately 130 MW of electricity to northern Aleppo, selling it at prices ranging between USD 0.11 and USD 0.13 per kilowatt-hour (kWh), payable in Turkish lira (Interview, NW1, 2025).

In Idlib, a company called Green Energy operates an electricity supply and distribution system similar to those of the other two companies, albeit at higher prices that range between USD 0.13 and USD 0.16 per kWh for households (Interview, NW1, 2025). The company is connected to HTS, which controlled Idlib at the time, and the transaction is conducted through an intermediary Turkish company, according to the findings of a recently published investigation (Almuhammad, 2026). Green Energy has likewise rehabilitated the local grid and connected it to Turkey. At the time of the field research, the company imported 100 MW of electricity from Turkey and made efforts to raise it to 200 MW in order to meet the continuing expansion of its service area.

Unlike the other two companies, Green Energy has placed particular emphasis on expanding local electricity generation by encouraging local investors to establish solar farms and feed their output into Idlib's local grid. As a result, between 400 and 450 small- and medium-sized solar farms have been installed in Idlib, with total investment costs estimated at approximately USD 75 million, according to a member of the Solar Farm Owners' Committee (Interview, DA3, 2025). Most investors are local residents, including households, land-owning farmers and even some government officials. Data on the precise share of solar electricity in the electricity mix in Idlib is unavailable; however, some experts' estimates suggest that solar energy accounts for 15-20 per cent of the electricity mix. Green Energy, the sole purchaser, initially purchased electricity from solar farms at 55 per cent of the retail tariff, later reducing this share to 45 per cent (nearly USD 0.065 per kWh). An investor reported the absence of a regulatory framework for the exchange, noting only the five-year contract that he signed with the company, which allows the company to unilaterally alter prices and conditions to its advantage (Interview, DA3, 2025).

By 2022, Idlib Governorate and northern Aleppo were the only regions in Syria enjoying a continuous electricity supply. The electricity sector in north-west Syria had become integrated with the Turkish energy sector in terms of pricing, technical standards and financial arrangements. This configuration currently makes it unfeasible to reconnect the electricity network in north-west Syria to the national grid (Interview, DA4, 2025). On the other hand, Turkey supplies these areas using an isolated, island system, which appears to be the only feasible arrangement, given that Turkey is an integrated member of the European Network of Transmission System Operators for Electricity (ENTSO-E). Therefore, it is unclear to what extent Turkey can increase or continue its supplies to the north-western sub-grid.

4.3.2 Political assessment

From a governance perspective, no contractual framework has been publicly disclosed regarding arrangements between private electricity suppliers and local and central authorities. As a result, the nature and extent of private companies' involvement in electricity-infrastructure assets in the region – including substations, transmission lines and distribution networks – remain largely opaque. These assets are operated without any discernible role for the state-owned electricity company, which continues to exist de jure but whose resources have de facto been subordinated to private operators. In Idlib, for instance, employees of the public electricity company are now working for Green Energy (Almuhammad, 2026). This blurring of boundaries between public and private interests occurs in a context marked by a lack of transparency regarding company ownership, corporate structures and revenues.

Table 1 summarises the key characteristics of the three energy subsystems in late 2025.

Table 1: Key characteristics of the fragmented energy regime in late 2025

Region	Operator	Legal framework	Electricity sources	Energy tariffs
National grid	Ministry of Energy	Still under Law No. 32 of 2010 + RE Law No. 41 of 2022 Institutional restructuring	12 operating centralised power plants Growing renewable sector 50% demand gap	Residential tiers ~USD 0.05-0.11 per kWh Production cost ~USD 0.12-0.18 per kWh
North-east	AANES Energy Authority (grid supplies) + Municipalities (diesel generator supplies)	No effective regulator; partial law only (Law No. 9 of 2024) Major gaps for renewables / generators / investment	Sweidiya gas turbines (all low output) Diesel generators are dominant 90% demand gap	Grid tariff ~USD 0.01 per kWh Diesel generators 15 times higher
North-west	Private suppliers: AK Energy, STE, Green Energy; local authorities (Salvation Government / councils)	No legal framework has been officially adopted Not fully integrated to the state bodies	Imports from Turkey and expanding solar farms	N. Aleppo ~USD 0.11-0.13 per kWh Idlib ~USD 0.13-0.16 per kWh Solar purchases 45% of the retail tariff

Source: Author

The need for energy integration across Syria's three regions is underscored by the configuration of electricity, oil and gas infrastructure, which indicates limited prospects for building stable, self-sufficient energy systems in any one region in isolation. North-east Syria – home to the country's largest oil fields – lacks oil-refining facilities as well as large-scale power plants. As a result, crude oil is processed through rudimentary methods, producing low-quality fuel that is used extensively for electricity generation via diesel generators, thereby compounding substantial environmental, public health and economic harms to both urban and natural systems. By contrast, areas under the transitional government's control have all of the oil refining facilities and most of the power plants, which have the capacity to generate up to 4,500 MW, but due to a lack of fuel, generate barely 3,000 MW. North-west Syria, meanwhile, has almost no hydro-carbon resources or power plants, resulting in a greater interest among households, investors and local authorities in solar energy. Nevertheless, this region has experience with operating smart grids – including smart metres, prepaid systems and digital services – benefiting from political and technical support from Turkey. Therefore, we can identify several areas of mutual need and opportunity to integrate the three energy sub-regimes into a unified national energy regime that draws on oil and gas resources, refining and power-generation infrastructure, and technical and administrative experience.

Finally, it should be clear that this fragmented energy regime is a legacy of the wartime period and is currently undergoing a transition. The following section continues the meso-level analysis of the ongoing government-led transition towards a new energy regime.

5 Technical and political transitions in the making

More than a year after the fall of the Assad regime, the electricity sector is undergoing significant changes. The following sections elaborate on four aspects of these changes, including the restructuring of governance bodies (Section 5.1), the reopening of energy markets (5.2) and the rapid increase in electricity tariffs for households (5.3). In the final part, the analysis moves from the meso to the micro level to examine renewable-energy systems as a niche and an opportunity for a transition towards sustainability (5.4).

5.1 Restructuring of governance bodies

In August 2025, President Ahmed al-Sharaa issued Decree No. 150 of 2025, merging the Ministries of Electricity, Oil and Mineral Resources, and Water into a single Ministry of Energy (SANA, 2025a); it is described as “an institutional gamble undertaken in a politically and security-unstable context” (Interview, DA4, 2025). The decree, however, was issued six months late, as the Ministry of Energy had been operating since February 2025 (The Syria Report, 2025).

The decree is a response to the substantive interdependence of water, electricity and oil, as well as to the policy objective of reducing administrative and coordination burdens. However, the operational merger proceeded too rapidly, with insufficient consultation and planning, reflecting a predetermined top-down approach (Interviews, NW1, DA3, 2025). In such circumstances, individual factors become decisive, notably: Who is leading the merger and overseeing the composition and capacity of the professionals implementing it? In this case, the restructuring of the electricity sector is being led by the new Minister of Energy, Muhammad al-Bashier, who previously served as head of the Syrian Salvation Government in Idlib prior to the regime’s fall. The minister is relying on a newly established core team consisting of former Syrian Salvation Government staff as well as staff of the “private” company Green Energy, including former CEOs of Green Energy who are serving as deputy ministers (Almuhammad, 2026). This core team is implementing institutional reforms and rehabilitating infrastructure. However, many independent experts said that the new administrative team lacks the necessary qualifications. This observation comes amid complaints that the government marginalised existing staff and independent experts, whose loyalty to the government is viewed with suspicion (Interviews, DA3, DA4, 2025).

This change in energy governance facilitates a move towards liberalisation and market-oriented policies. The government has established three state-owned holding companies for oil, electricity and water services (SANA, 2025b). Each company replaced public institutions such as the Public Establishment for Transmission and Distribution of Electricity, and more than 20 public companies affiliated with it, to become the Syrian Electricity Company. From the government’s perspective, freeing the new companies from constraints relating to contracting, recruitment, salaries, etc., will enable them to operate with greater flexibility and competitiveness within the energy market.

Among these companies, the ministry acts as the regulator because the sector remains governed by Electricity Law No. 32 of 2010. “We are in the process of amending the law, establishing the regulatory authority for electricity, and transferring regulatory competences from the ministry to it” (Interview, DA4, 2025). Creating regulatory bodies has become a widespread practice in liberal governance since the 1980s in developed economies. This practice was later adopted by developing countries through the creation of economic liberalisation programmes that sought to improve government efficiency and reduce the dominance of the public sector in the provision of energy (Choynowski, 2004).

Nevertheless, since most of the currently applicable energy legislation dates back to the previous regime, the selective invocation of existing laws creates institutional ambiguity. Some independent experts are concerned that this could lead to corruption within state institutions, which are already criticised for being non-transparent (Interview, DA3, 2025). An empirical example of energy-market-making in Syria is Decision No. 154, adopted by the Ministry of Energy in 2025 as a regulatory framework to accelerate small-scale, grid-connected renewable-energy projects. The new decision offers a tariff of USD 0.04 per kWh for solar farms without storage capacity, and USD 0.06 where storage is included (Al-Dahiyat, 2025). The decision ignores the existing regulation, Electricity Law No. 32 of 2010, and the 2021 and 2022 amendments that allow for the same activities at higher prices, nearly USD 0.08 per kWh generated by solar panels. Nevertheless, while the existing laws allow for peer-to-peer (P2P) trading, the new decision suggests that the state should be the sole buyer. Under such institutional and legal ambiguity, there are concerns among experts and stakeholders that the institutional restructuring could devolve into a patronage-based system that benefits a small group of elites at the expense of the broader population.

5.2 An emerging electricity market

Electricity in Syria has long been monopolised and subsidised by the state. Only after the fall of the Assad regime did it become effectively open to domestic and international investment. This section analyses the state-led marketisation of the electricity sector as an energy regime transformation. It presents developments that include increases in electricity tariffs and the establishment of an electricity regulator, and it provides an overview of signed investment agreements, covering both fossil fuel-based and renewable-energy projects.

In November 2025, the Ministry of Energy increased the electricity price for households from a nearly negligible level to approximately USD 0.12 per kWh, except for the first 150 kWh consumed every month, which are subsidised at USD 0.05 per kWh (Ministry of Energy website, 2025). The ministry justified this by stating that the current cost of generating 1 kWh of electricity in Syria exceeds international benchmarks due to the obsolescence of the generation and distribution infrastructure and that the cost is estimated to be USD 0.12 per kWh (Interview, DA1, 2025). However, this justification did not prevent public protests in January and February 2026. These were the first continuous protests against the transitional government, and lower energy prices are still one of the primary demands of the public.

The second key step towards liberalising the electricity market is the creation of an electricity regulator – an independent government agency. The regulator is intended to be a neutral party that is positioned between the ministry, state-owned companies, private companies and the general public. The ministry “aims to establish a balanced and transparent energy market” (Interview, D4, 2025) and promises a modern legislative architecture, including mechanisms that are critical to a functioning electricity market, such as feed-in tariffs, P2P trading, wheeling tariffs and other frameworks necessary for effective public–private partnerships.

The literature indicates that such practices could strengthen the system’s resilience and support the decentralisation of the energy regime while fostering competitive innovation and productivity gains among a broad segment of small-scale producers (Mortada, 2025). However, in practice, there is greater concern among independent experts that such a government-led restructuring follows a top-down approach that offers less transparency and insufficient consultation with stakeholders and participation by local experts (Interview, DA3, 2025).

Even so, the government’s agenda has been marked by a substantial number of energy-investment agreements, including large-scale projects with Qatari, Turkish, Saudi and American companies. Most notably, the government signed an agreement with UCC Holding – a consortium of Turkish, US and Qatari companies (Atassi, 2025) – to build five power plants: four

gas-fired thermal plants and one PV plant, each with a generation capacity of 1,000 MW (Ministry of Energy, 2025).

A key concern raised by some interviewees is the contracting framework between the government and these companies, which reportedly relies on direct contracting without a competitive process or transparent procedures. Although direct contracting is permitted under Syrian law as an exceptional mechanism, it has increasingly become the default route for most major investments across the energy, real estate and transport sectors, among others (Interview, D4, 2025).

Regarding the renewable-energy market, the Ministry of Energy has demonstrated a strong interest in investment in renewable energy; it has activated the aforementioned Decision No. 154 regarding small- and medium-scale renewable-energy projects (see Section 5.1). Until May 2026, the ministry reported receiving numerous investment proposals in renewable energy from both domestic and regional investors: “In less than a year, we signed agreements with investors for projects with generation capacity of up to 1,450 MW from renewable sources, equivalent to around 60 per cent of current production capacity” (Interview, DA1, 2025). These projects include one large-scale 1,000 MW project by UCC in Deir-ez-Zor (east) and several smaller projects with a total capacity of 500 MW in Aleppo and Idlib (north) (Interview, DA1, 2025). The interview, however, was conducted before the Ministry of Energy announced an additional two projects with a total capacity of 1,200 MW, including wind and solar projects in Homs and rural Damascus (SANA, 2026), which would raise the promised generation capacity of renewables to 2,650 MW.

Taken together, the planned power plants and renewable-energy projects, alongside current electricity generation, would be sufficient to meet Syria’s domestic demand, estimated at between 5,000 and 7,000 MW. Yet the government’s ambitions extend beyond domestic supply; it has reactivated the Arab Electricity Market Agreement, signed by 14 Arab countries in late 2024 (Abaño, 2024), while increasing electricity supplies and expanding grid interconnections with Turkey, Lebanon and Jordan. The aim is to reposition Syria in regional energy markets by leveraging the country’s location and existing infrastructure (Interview, DA1, 2025).

5.3 From a right to a commodity: shifts in government policy

Prior to the conflict, electricity was heavily subsidised by the state, resulting in tariffs that were substantially lower than those in neighbouring countries. Even after the outbreak of the conflict and the collapse of the Syrian lira, tariffs remained unchanged, rendering the price of electricity per kWh almost negligible. As one economic expert interviewed in Damascus observed, “Some Syrians have become accustomed to consuming electricity without paying its cost, and this will now come to an end – there is no free lunch anymore” (Interview, DA3, 2025). The government’s conception of electricity has shifted from a citizen entitlement that the state is obliged to provide to a commodity for which consumers are expected to pay. A government official explained,

> In 2024, the state spent USD 1 billion subsidising the electricity sector, even though supply did not exceed a few hours per day, and it has recovered less than 5 per cent of that cost … What national economy can continue to sustain such a burden? (Interview, DA4, 2025)

On the other hand, more than 90 per cent of the population lives in poverty (OCHA, 2024) and cannot afford higher electricity prices. This applies not only to low-income but also middle-income households: A family consuming about 300 kWh per month would pay roughly USD 26 per month. This minimum cost would be equivalent to almost 37 per cent of monthly per capita income (World Bank, 2025b). The economic burden is therefore on both the government and the population. “The government adopted a shock-therapy approach to electricity pricing. The move was undoubtedly shocking to the public, which responded with resistance and organised

protests against the tariff decision … but the decision had already been taken" (Interview, DA4, 2025). Protesters, in turn, have raised concerns about energy justice and affordability and demand protection for lower-income groups: "Electricity should not turn out to be a privilege," stated a protester.

Most of the interviewed experts agreed that pricing electricity at its real cost is a key element for establishing the energy market and for the long-term sustainability of electricity supply. However, they also emphasised that the government should support vulnerable groups in adapting to the new market. Reconstruction through marketisation, which is one way to describe the current government approach, ignores the long-term prospects for socially inclusive reconstruction and associated peace-building, as it creates unequal access to electricity and, therefore, escalates social tensions and conflicts.

Transparency and communication between the government and society during periods of transition – when public services are being transformed – can be decisive in determining whether such reforms succeed or fail (Chaplain & Verdeil, 2025). However, these elements are missing in Syria's case: The government's public discourse, through its statements in Arabic, reveals a shift away from the narrative of "reconstruction" and towards a narrative of "economic prosperity" and growth driven by private investment. Therefore, the government is showing a strong orientation towards involving both international and domestic private investors across the electricity supply chain, particularly in generation and distribution. Meanwhile, it displays less sensitivity and recognition of the social impacts of such policies.

On the issue of transparency, some local experts are concerned about replicating Idlib's company Green Energy in Damascus and elsewhere – a business model that reportedly entailed the transfer of state-owned infrastructure to a private company without a publicly disclosed agreement. Green Energy thus constitutes a distinctive case in which public and private assets appear to be intertwined within a formally private company whose ownership is linked to the authorities in non-transparent ways.

5.4 The transformative window for renewables

This section focuses on applying an STT micro-level analysis, where "niches" are innovative practices that enable transformative change in the energy regime. For the electricity sector in Syria, the most promising transformative opportunities lie in integrating off-grid electricity generation from the community-led "solar boom" into the national grid. Cross-validated estimates from local experts suggest that off-grid PV capacity exceeds 2,200 MW (Interviews, DA2, DA3, DA4, 2025), which is equivalent to 73 per cent of the aggregate generating capacity of centralised power plants as of December 2025. Integrating this off-grid generation into the national grid and enabling trading through grid operators could yield multiple benefits, including reducing the environmental and economic costs of electricity supply; creating new value chains and economic opportunities for households as well as small- and large-scale businesses; and, more importantly, allowing for a more socially inclusive reconstruction of the energy regime by offering a form of public participation in electricity generation and trading (Kayed et al., 2025).

However, the envisaged integration of solar electricity generation into the grid faces three key challenges: technical, legislative and political.

Technically, most installed solar systems are off-grid, stand-alone units. Each standalone system entails electricity wastage, which can reach up to 40 per cent in some systems (Al-Zarrad, 2025). Nevertheless, during field visits in Qamishli and Damascus, we did not observe any collective or integrated solar systems; mini-grids remain very rare in Syria. To reverse this pattern, the government has to support the shift from off-grid systems towards hybrid configurations that can operate in parallel with the grid. The national grid is capable of accommodating

the currently available capacity (Interview, DA3, 2025). However, the challenge would be to maintain grid stability as the share of solar generation rises in the energy mix (Interviews, DA3, DA4, 2025).

The absence of a sound legislative framework is the second challenge, as mentioned before (Section 5.1). The only reference that has been made to this topic is in Electricity Law No. 32 of 2010, which does not recognise household systems. At this level, rules for feed-in tariffs, the creation of mini-grids, P2P trading and related arrangements are absent.

The third challenge is political, in which the centralised fossil fuel-based power plants remain a cornerstone of government policy. A representative of the Ministry of Energy explained: “Renewables are important, but to be clear, we are working with what is available because we want electricity as quickly as possible, with the highest efficiency and through the most reliable means” (Interview, DA1, 2025). Although the ministry recognises the high potential of renewables in Syria, policy efforts are focused on the restoration of the national grid and the centralised power plants, as this is the shortest pathway to a stable electricity supply, even if it is unsustainable. From a planning perspective, the lack of data on off-grid generation capacity and the reliability of installed solar systems “constitutes a fatal obstacle to efforts to integrate these sources into the national grid” (Interview, DA2, 2025).

The relationship between centralised power plants and standalone energy systems is not merely a technical issue; it also reflects power relations among stakeholders. Developing a mini-grid may lead to a decentralised energy regime, and thus decentralises power. In the fragile Syrian context, the decentralisation of electricity raises concerns among both the government and the public (Interview, DA2, 2025). The first is energy justice, as the national grid bears fixed costs for electricity transmission and distribution; the proliferation of parallel networks can shrink the grid’s subscriber base and increase costs for the remaining customers, who are often among the most vulnerable, as illustrated by the case in Lebanon (Chaplain & Verdeil, 2025). The second concerns necessity. As one expert put it:

> We have a circular national grid infrastructure that extends across all inhabited areas, including the most remote villages. Although the grid has sustained substantial damage, it has undergone meaningful rehabilitation over the past year … rehabilitating and operating this grid has higher returns than pursuing energy decentralisation. (Interview, DA3, 2025)

The national grid remains a strategic asset and constitutes essential infrastructure for the future electricity market, so it should be made capable of integrating off-grid capacity, rather than replacing it with mini-grids or decentralised systems.

Conversely, the literature indicates that centralised governmental control of the electricity sector can further consolidate relations of dominance, which could undermine social peace over the longer term (Edwards, 2018).

6 Conclusion

This paper contributes to the debate on pursuing an environmentally sustainable and socially inclusive (affordable and participatory) reconstruction of the electricity sector in post-war Syria. It is motivated by the need to stimulate debate on reconstruction pathways in a country that has recently emerged from a devastating war and now faces the growing impacts of climate change. The paper draws on the multi-level STT framework to: a) assess the electricity landscape in Syria, including governance frameworks in the post-Assad era, b) analyse opportunities and challenges associated with promoting renewable energy to achieve a transformative

reconstruction and c) formulate policy recommendations (Section 7) to make the reconstruction as transformative as possible.

The analysis of the electricity landscape and its governance structure shows that this landscape is still characterised by regime fragmentation, as the national energy map is divided into three distinct and disconnected electricity sub-regimes operating across the north-east, north-west and areas served by the national grid (Section 4). In the north-east, which has long been under the SDF's control, electricity supply relies primarily on diesel generators operating through informal mini-grids; part of the region was not reconnected until May 2025 to the national grid for the first time since the war. Second, the north-western region around Idlib, formerly under opposition control, is dependent on electricity imports from Turkey through private and semi-private companies, alongside a growing reliance on solar systems. Third, the remaining governorates in Syria, which were under the control of the Assad regime prior to December 2024, continue to rely on the partially restored national grid and centralised power plants. Across the three regions, the "solar boom" at the community level is significant and rapidly expanding.

This fragmentation constrains the prospects for recovery and cooperation in Syria's electricity sector, as none of the three regions is capable of establishing a stable electricity system on its own. Although the north-east holds most of the oil and gas resources, it lacks the infrastructure required for refining and power generation. The reverse is true for areas served by the national grid, where oil-refining facilities and most power plants are located, despite limited oil and gas resources. The north-west, in contrast, lacks both hydrocarbon resources and generation facilities, but it cooperates with Turkey and has developed an effective electricity distribution and revenue-collection system. Especially in Idlib, a feed-in tariff was applied to encourage the local private sector to invest in solar farms.

Covering more than a year of developments in the electricity sector under transitional government rule, the study concludes that the government is moving towards a state-led, market-driven and fossil fuel-dependent energy regime. It has prioritised the rehabilitation of centralised power plants and the national grid. Renewable energy is seen as a complementary resource. Meanwhile, the newly established Ministry of Energy is reforming legal and institutional frameworks by replacing public enterprises with state-owned holding companies designed to lead the energy market and mobilise resources through partnerships between the state and the private sector. It has also transferred the financial burden of the provision of electricity from the state to the public after significantly raising electricity tariffs, with significant social impacts.

Our second set of findings relates to the opportunities and challenges of renewable-energy development to achieve a transformative reconstruction. The analysis identifies a significant opportunity for connecting millions of household-owned solar systems to the national grid. Such integration could broaden citizen participation in electricity generation and trading, expand generation capacity through renewable resources, reduce electricity costs and create new local economic opportunities. From the multi-level perspective of the STT framework, these household solar systems constitute a promising niche innovation that has emerged outside the dominant electricity regime and could contribute to a more sustainable, resilient and inclusive energy system.

At the same time, the findings reveal substantial challenges that currently prevent this niche from influencing the broader regime. Most existing solar systems were installed as isolated off-grid solutions and lack the technical standards, equipment and infrastructure required for grid integration. Regulatory frameworks governing grid connection, electricity trading, net metering and compensation mechanisms remain absent. Institutional capacity is also limited, particularly with regard to planning, monitoring and stakeholder coordination. More broadly, integrating distributed renewable-energy systems requires a political commitment to transparency, participation and long-term sector reform.

These findings suggest that the most promising pathway to transformative reconstruction does not lie in replacing the national grid with decentralised systems, but rather in creating productive linkages between the government-led reconstruction of the national grid and the rapidly expanding citizen-led solar sector. Extending this logic beyond the electricity sector, the study proposes “transformativity” as a guiding principle for Syria’s reconstruction. Across sectors such as housing, transport and agriculture, transformative reconstruction would involve identifying and supporting niches capable of generating environmental, social and economic benefits while addressing the structural causes of vulnerability. Such an approach could provide a common framework for reconstruction efforts and contribute to climate adaptation, long-term peace and stability.

7 Recommendations

This section builds on the findings of this study to propose policy recommendations for national policy-makers and international development cooperation to support a transformative reconstruction of the electricity sector in Syria. Since the paper outlines the need for integrating electricity generated by the growing number of off-grid household solar systems into the national grid, the following recommendations suggest a set of interconnected roles, not only for the government and development cooperation but also for local non-governmental actors.

The Syrian transitional government is responsible for paving the way for integration. This paper recommends two key roles for the government: reform regulatory and institutional frameworks and restore the grid’s capacity to integrate small-scale solar systems. At the policy level, the transitional period is an opportunity to develop a pro-integration governance framework for the electricity sector, one that not only enables investors but also enables the participation of communities and households. Ideally, this should be done through an independent regulator with clear mandates and transparent decision-making to fill the regulatory gaps, including tariff-setting, rules for licensing and grid access, feed-in tariffs, wheeling tariffs and P2P trading. This set of rules provides an essential foundation for integration.

At the technical level, the government should lead the transition from standalone, off-grid solar systems to connected hybrid and mini-grid systems. This requires a nationwide intervention to upgrade existing systems, one that covers both the necessary equipment (e.g. certified inverters, protection devices, smart metering and operational tools for grid stability) and the required knowledge (including training for municipal decision-makers and installers about planning and implementing integrated systems and connection standards).

Some of the aforementioned policy and institutional requirements are currently being developed with limited transparency and public participation. This is an area where local non-governmental actors – including civil society organisations, trade unions and local associations – can play a role. These non-governmental actors have the motivation and capacity to monitor government policies and practices and to maximise the transparency and inclusivity of decision-making processes. Furthermore, they can improve the implementation of policies by ensuring sound governance. They can also serve as mediators between the government, its contracted companies and communities of small-scale electricity producers to facilitate information flow and negotiations between the state, citizens and markets.

International development actors should support these local government and non-governmental actors in fulfilling these roles. International actors can provide technical cooperation to support local governments with technical adaptation measures and the creation of independent regulatory bodies. They can provide capacity-building and training to support non-governmental actors in monitoring policies and mediating between the government and communities. At the community level, international development cooperation should support the grassroots energy

transition towards expanding renewable-electricity capacity and protect vulnerable households from tariff shocks. For instance, they can provide green financing instruments that blend grants and concessional finance while collaborating with the government and other local actors. This financing should focus on expanding generation capacity, transitioning from standalone to integrated systems and promoting energy-efficiency programmes across households and businesses. Even as resources for development cooperation decline, earmarking portions of the available development financing for such support could unlock further economic cooperation and a more sustainable reconstruction pathway.

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Annexes

Annex 1 List of interviews

Interviewee code	Location	Affiliation	Date
NE1	Qamishli	Energy Authority in NE Syria	07-08-2025
NE2	Qamishli	Energy Authority in NE Syria	25-08-2025
NE3	Qamishli	Qamishli municipality	25-08-2025
NE4	Qamishli	Diesel generator owner	08-08-2025
NE5	Qamishli	Solar systems supplier	14-08-2025
NW1	Aleppo (remote)	Electricity expert	13-11-2025
DA1	Damascus	Ministry of Energy	02-10-2025
DA2	Damascus	Ministry of Energy	14-10-2025
DA3	Damascus	Energy expert	03-12-2025
DA4	Damascus	Ministry of Energy	03-12-2025

Annex 2: List of workshop participants

Workshop title: Imagining an independent electricity future in Syria (indicators, policies, potentials, and challenges)

Date: 17-12-2025

Location: Damascus, Kafr Sousa

Expert code	Specialisation	Affiliation
E1	Engineer and technical expert in solar energy	Independent activist
E2	Economic and governance expert	Omran Center for Strategic Studies
E3	Climate change	Syrian Climate Change Program (NGO)
E4	Energy economics	University of Damascus, Faculty of Economics
E5	Research consultant	UNDP (research consultant)
E6	Electricity consultant	Ministry of Energy
E7	Civil society activist and administrative expert	The Day After Organization
E8	Renewable energy consultant	Independent
E9	Academic and social science researcher	University of Damascus
E10	Environmental activist	Syrian Climate Change Program (NGO)