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STRATEGIC BRIEF

Rebuilding Gaza's Electricity Sector

From Blackout to Resilience

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Diplomatic efforts have coalesced around what has been widely described as President Trump's 20-point Gaza peace plan and reinforced by a United Nations Security Council resolution. Both emphasize stabilization, security arrangements, and phased reconstruction as prerequisites for longer-term political progress. In parallel, the creation of the Civil-Military Coordination Center (CMCC) and the active engagement of over 50 governments, including Arab nations; regional actors; and international institutions signal an uncommon level of alignment around restoring basic functionality and reducing the risk of renewed instability.

Gaza's electricity sector has suffered near-total collapse, with over 90% of its electricity infrastructure damaged or demolished, leaving 2.3 million residents without reliable power. Essential services—hospitals, water desalination, and wastewater facilities—are non-functional, threatening lives and public health. The energy sector's recovery needs alone are estimated at \$3.2 billion within a broader \$67.1 billion multi-sectoral recovery requirement. Reconstruction of Gaza's electricity sector is not a standalone technical exercise—it is a foundational pillar for the success of both the 20-point plan and the UNSC resolution.

So, what's the plan for rebuilding the electricity sector?

As presented below, a multi-phased approach is required, identifying and addressing key barriers and levers at each stage, anchored in a strategic partnership between local and international stakeholders.

Phased Implementation: From Lifesaving Power to Resilient Systems

Pre-war, Gaza operated under a 60% deficit, with rolling outages and service windows as short as 4–12 hours per day. Peak demand exceeded 500 MW, while available supply averaged 180–200 MW. Rooftop and utility-scale solar generation had grown to an estimated 80 MWp, and Gaza's electricity distribution company (Gaza Electricity Distribution Company (GEDCO)) had made progress on effective control of the grid through SCADA, remote switching, and smart metering. Today, over 90% of Medium and Low Voltage networks are destroyed, 93% of transformers are inoperable, and none of the six utility-scale solar projects are operational. Rooftop solar has also been heavily damaged. The few kilowatts reaching critical services come from small, sporadic generators and solar systems, insufficient for households, clinics, or hospitals.

Reconstruction efforts for Gaza's electricity sector converge around a shared vision: restoring essential services immediately while laying the foundation for a modern, resilient electricity sector. The Gaza Recovery and Reconstruction Implementation Program lays out the Palestinian Government's official strategic plan for recovery, anchoring energy within a \$67.1 billion multi-sectoral framework. Complementing this plan, the local utility in Gaza has developed a relief



Reconstruction Funding

\$1.5B estimated investment to rebuild and modernize power sector



Grid Infrastructure Destroyed

>90% of power network damaged or demolished



Critical Power Gap

58MW urgently needed to energize essential facilities

plan that provides technical insights into feasible restoration options—starting with lifesaving interventions and extending to grid rehabilitation and modernization. Combined, these plans outline a three-phased trajectory, from emergency response (0–6 months) to medium-term stabilization (6–48 months) and long-term sustainability (>4 years).

Phase I. Short-Term (0–6 Months): Lifesaving Power Restoration

Objective: Rapidly restore electricity to critical facilities to save lives and stabilize basic services.

To achieve this objective, structured field surveys are needed to validate Interim Rapid Damage and Needs Assessment (iRDNA) assumptions, quantify actual damage, and refine cost estimates. Short term solutions are likely to center on:

Immediate decentralized solutions: Diesel generators and fuel are critical to power hospitals, water facilities, and other essential services. Off-grid solar with battery storage can provide lighting, phone charging, and refrigeration for shelters and camps.

Restoring interconnection with the Israel Electric Corporation (IEC): Restoring full supply to the Kela-Kisufim line, with 4.5MW currently operational (out of 12MW), and replicating for others, could provide immediate relief in the middle governorate. The middle governorate's distribution system has sustained the least damage (42%) and a request to expand services to critical water, sanitation and health critical infrastructure is pending.

Rapid Repairs: Field teams will need to replace downed poles, string insulated cables, and install modular substations in secure locations to energize critical sites. The local grid utility (GEDCO) has identified 75 priority sites (hospitals, clinics, water wells, desalination and wastewater plants) in the middle governorate. Energizing these sites would require about 58 MW of supply. Gaza's sole power station (which typically supplied 60–80 MW out of a 140 MW nominal capacity) must be repaired and brought back online as far as fuel allows. In the short term, limited spare parts and repairs can restore GPP to a simple cycle producing 20–30 MW. Securing consistent diesel supply to GPP via Israel or Egypt is essential.

Estimates: over 380 generators and fuel supplies; 15,000 mobile solar kits and hybrid solar plus battery systems for critical facilities.

Electricity supply options in Phase I affect multiple critical services:



Diesel generators: fast to deploy, essential for hospitals and WASH facilities, but costly and fuel-dependent.



Solar + batteries: lower operating costs and reduces fuel convoys; higher capex; installation speed depends on access and equipment availability.



Grid imports: cheapest per kWh and immediately support critical services, but depend on feeder-line repairs and coordination.

A balanced mix supports health, water, sanitation, and emergency operations during Phase I and improves overall sustainability.

Early Barriers and Mitigations:

	RISKS	MITIGATION STRATEGY
01	Precarious security conditions	Coordinate with CMCC and humanitarian agencies to enforce strict security and safety standards; schedule works based on security and UXO risk assessment
02	Restrictions on fuel and equipment entry; unclear timelines for feeder reactivation.	Intensify diplomatic negotiations to expedite permits and leverage humanitarian channels, including through newly formed CMCC
03	Delays in procurement of equipment	Prioritize suppliers with existing stock and proven delivery records.
04	Shortage of skilled technicians for installation and maintenance of generators and solar kits	Deploy rapid virtual and hands-on training; deploy technologies familiar to and/or repairable by local technicians
05	Community mistrust and distribution inequities	Promote local ownership/transparent distribution mechanisms; establish social oversight and ensure fair access through local leadership

Phase II. Medium-Term (6-48 Months): Rehabilitation and Reconstruction

Objective: Shift from emergency fixes to rebuilding a power system capable of supplying electricity to all consumers.

An integrated resource plan is essential for sequencing power sector investments and aligning electricity supply with Gaza's multi-sector reconstruction needs. A transparent, consultative, least-cost planning framework, would guide investments to meet the needs of priority services and economic activity while reducing risks associated with fragmented or duplicative interventions.

Transmission and distribution network reconstruction: More than 80% of Gaza's 1,050 km medium-voltage and 4,700 km low-voltage lines require full rehabilitation or replacement, alongside the installation of roughly 2,000 transformers. This phase entails gradually rehabilitating, reconstructing and modernizing grid infrastructure, starting in the middle governorate and rebuilding outward to deliver power across all five governorates, albeit with limited supply until generation is increased.

Restoring Generation Capacity: Reliable electricity hinges on restoring and diversifying generation capacity. Thus, a parallel priority is reviving and diversifying the sources of electricity:

- **Gaza Power Plant (GPP):** In the medium term, GPP could potentially produce over 100 MW by replacing damaged turbines, restoring fuel tanks, and the cooling and control systems. International brokers will need to help guarantee fuel deliveries so that GPP can serve as a stable local generation anchor, as well as expand beyond nominal capacity.
- **Cross-Border Feeder Lines:** Before the war, 120 MW was imported from Israel (via 10 feeder lines). Rebuilding includes negotiating and technically restoring these connections. IEC

infrastructure to Gaza will need repairs (some lines were damaged) and testing. Given the political sensitivities, bringing the IEC feeds back might require third-party mediation, but it is a quick way to significantly boost supply. Furthermore, the Egyptian interconnection, which delivered up to 30 MW from Egypt until 2018 (via 2 lines to Rafah/Khan Younis) could be upgraded to deliver perhaps 50 MW or more to southern Gaza. Egypt has signaled willingness in the past to help on humanitarian grounds, and reconstruction can incorporate modernizing that link (e.g. new lines or substations at the Rafah border) with strengthened security measures.

- Utility-scale Solar and Battery Storage:** The conflict destroyed all six of Gaza's utility-scale solar PV installations (31 MWp in total) that were operational or under construction. With donor support, Gaza can replace and expand its solar farms. For example, rebuilding the 7.5 MW North Gaza sewage treatment plant array and the 7 MW east Gaza Industrial Zone array would provide clean power to critical facilities and reduce fuel needs. Given Gaza's land constraints and dense population, solar alone won't meet all needs, but it can contribute to reducing energy costs, enhance energy security, and increase resilience.

Grid Modernization and Revenue Collection Measures: Reconstructing the grid is an opportunity to upgrade its intelligence and efficiency. GEDCO had ~90% of its network under SCADA remote control and 90,000 smart meters installed. The war damaged much of this progress, but knowledge remains. The plan is to reinstall and expand smart controls: re-establish the SCADA control center, replace destroyed remote switches, and roll out tens of thousands of new smart meters (with a long-term target of 300,000 installed). This will help manage the recovering system efficiently, detecting faults quickly, balancing loads, and improving revenue collection by accurately metering usage. Rehabilitation contracts would include modern switchgear and protections that meet latest IEEE/IEC standards. The result should be a more resilient grid, with automated isolation of faults and better power quality, even as it's being expanded.

Early Barriers and Mitigations:

	RISKS	MITIGATION STRATEGY
01	Resumption of conflict disrupts/sets back reconstruction and power system operations. Fuel supply challenges.	Develop contingency plans for phased shutdown and rapid restart; pre-position critical equipment and supplies.
02	Delays in procurement of equipment	Use pre-procured materials stored locally, identify an expanded list of vetted suppliers
03	Limited workforce due to human capital losses and anticipated demand surge across sectors	Launch virtual and in-person workforce development programs; partner with technical and vocational institutions (TVET) for rapid upskilling and reskilling.
04	Financing gap for recovery and reconstruction	Continue building coalition of donors and development finance and secure commitments for grants and concessional loans.
05	Uncertainty in cross-border energy agreements	Develop interim agreements and technical committees to formalize protocols; include local authorities in negotiation and coordination processes

Phase III. Long-Term Vision for Reliability and Resilience (>4 Years)

Over the long term, Gaza's electricity sector must evolve into a more reliable, diversified, and increasingly self-sufficient system, while remaining grounded in the political and operational realities that will shape reconstruction for years. Achieving a sustainable system by 2035 requires three enablers: predictable governance, multi-year financing, and structured regional cooperation. These outcomes cannot be assumed; they must be built gradually. For example, leveraging Gaza's offshore natural gas resources will require sustained investment, technical capacity, and regional cooperation built up over time. Similarly, developing large-scale solar farms outside of Gaza—such as in the Sinai or Hebron regions—can help overcome local space constraints and provide clean energy through cross-border cooperation.

The most realistic path is to strengthen Palestinian institutions' technical capacity, secure long-term supply and revenue arrangements even before full operational control is possible, and use regional partnerships, with clear safeguards and international oversight, to ensure stability and reliability. Through incremental steps that expand local generation, modernize the grid, and establish trusted governance mechanisms, Gaza can move steadily toward a power system that reduces volatility, lowers dependency on emergency support, and serves as a stabilizing force for both Palestine and neighboring countries. This is not a single political leap but a practical, cumulative process that improves conditions now and keeps open the possibility of greater autonomy over time.

Local Capacity and International Partnership

Rebuilding Gaza's electricity sector requires a coordinated effort across local institutions, neighboring countries, international organizations, donors, and private-sector partners. Each actor has a distinct role that, when aligned, can create the predictability and transparency needed for large-scale reconstruction.

The iRDNA foresees that the Palestinian Energy and Natural Resources Authority (PENRA) will play an important role in shaping the technical direction of Gaza's power sector recovery. Its engineering and planning teams can help inform damage assessments, provide guidance on the design and sequencing of repairs, support adherence to national standards, and coordinate GEDCO, the Palestinian Electric Company (PEC), engineering, procurement and construction (EPC) contractors, and humanitarian and development actors as modalities evolve. PENRA may also participate in sector technical working groups and engage structures such as the CMCC once operational arrangements are better defined. Leveraging PENRA's experience will help maintain continuity and technical consistency throughout reconstruction.



Stakeholder	Core Responsibilities	Why This Matters for Stability & Predictability
Ministry of Planning and Finance	Recovery oversight, donor engagement, alignment with national frameworks.	Anchors reconstruction in multi-year planning; minimizes duplication; improves donor confidence.
PENRA	Sector planning, policy leadership, technical standards, donor coordination.	Ensures consistent sector governance; provides a unified counterpart for regional agreements; reduces fragmentation.
CMCC	Coordinates between local authorities, humanitarian agencies, and Israeli and Egyptian security forces; facilitates safe access for reconstruction materials and teams.	Reduces operational risk, ensures safe movement of equipment and personnel, and supports timely restoration of critical infrastructure.
Israel	Approves entry of materials and crews. Via IEC, coordinates feeder-line activation and enables near-term power imports.	Constructive coordination—with clear protocols and third-party mediation—reduces delays, lowers security risks, and helps rebuild predictable power flows that benefit both sides.
Egypt	Potential expansion of Rafah interconnection, support for regional gas/power linkages, utility cooperation.	Adds critical redundancy, diversifies supply sources, and improves resilience against system shocks.
World Bank, UN, EU, Regional Development Banks	Financing, fiduciary oversight, procurement standards, safeguards, technical assistance.	Provides transparency and accountability; protects investments; standardizes implementation across partners.
Donor Governments	Grants, concessional lending, climate finance, capacity-building support.	Secures multi-year funding needed for long-term infrastructure and reduces financing volatility.
GEDCO	Grid operations, maintenance, local implementation, customer services.	Enables reliable daily power flows; supports fast repairs; bridges local needs with external implementers.
PEC / PADICO	Operates Gaza power plant; invests in power infrastructure	Anchors local generation; enables rapid restoration; strengthens private sector resilience
Private Sector & EPC Contractors	Construction, renewable energy deployment, grid modernization, local workforce training.	Accelerates delivery at scale; brings modern engineering capabilities; strengthens local technical capacity.

Clear role division fosters a coordinated ecosystem, reducing uncertainty, accelerating reconstruction, and leveraging each actor's strengths. Local institutions lead sector planning and operations; neighbors provide essential access and cross-border stability; CMCC ensures safe, secure movement and coordination; international organizations guarantee transparency and oversight; donors supply predictable financing; and private contractors deliver high-quality infrastructure efficiently. When aligned, these partnerships enable Gaza to rebuild a power system that is more reliable, safer to operate, and less vulnerable to disruption—supporting improved living conditions for Palestinians while contributing to regional stability and reducing the likelihood of repeated humanitarian crises.

Looking Ahead

Rebuilding Gaza's electricity sector is essential not only for humanitarian relief but for creating the stability and predictability that benefit all parties in the region. It is a foundational step toward stability, recovery, and long-term peace, as emphasized in recent diplomatic efforts and international frameworks. While long-term political arrangements remain uncertain, a pragmatic path is clear: restore essential services quickly, rebuild core networks with strong oversight, and expand Palestinian operational capacity in ways that reduce volatility and create structured channels for cooperation.

By grounding reconstruction in transparency, diversified supply, and technical partnerships that include clear safeguards, Gaza's power sector can evolve into a more resilient and manageable system—one that supports Palestinian livelihoods while also contributing to a more secure and stable environment along Israel's southern border. This approach prioritizes practical outcomes today while building options for more durable arrangements as political conditions evolve.

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