

# LEBANON'S ENERGY SECTOR

## 2022 Breakdown

*In Lebanon, the state-owned Électricité du Liban (EDL) has accumulated catastrophic losses over the years with its operations not being financially viable, leaving millions of Lebanese at the mercy of the generator mafia.*

*Following months of discussions, a deal backed by the U.S. to transmit natural Egyptian gas to Lebanon via Jordan and Syria to remedy the severe shortfall in power is nearing completion; however, it is at risk of derailment over several concerns, foremost being the ongoing dispute over whether the arrangement would violate the U.S. sanctions imposed on the Syrian government.*

*Considering Lebanon's geographical and meteorological conditions, renewable energy, especially in the form of solar and wind energy, is a viable and profitable power source.*

o Électricité du Liban (EDL) has never managed to meet national power demand; in spite of creating a \$2 billion dollar budget deficit in 2012, EDL barely satisfied an estimated 55% to 64% of Lebanon's electricity demand in 2018.<sup>1</sup>

In May 2020, Minister of Energy Raymond Ghajar claimed that losses in the Lebanese power industry cost the government roughly \$1.6 billion/year; this amounts to around 3% of Lebanon's total GDP and represents 40% of the country's national debt.<sup>2 3</sup>

o EDL's average production price is between \$.014/kWh and \$.016/kWh. Since 1994, Lebanon's electricity tariffs have been set at an average of 0.095 USD/kWh; this pricing was maintained in spite of the fluctuation of oil prices.

o Moreover, technical and non-technical losses in transmission and distribution networks accounted for 36% of the energy pumped into EDL's network in 2018, i.e. merely 64% of EDL's generated energy was invoiced.

o Furthermore, EDL has been inconsistent in billing and collecting revenue: between 2016-2017, bill collection rates amounted to, respectively, 74% and 66%. This has all culminated into significant losses for EDL over the years.<sup>4</sup>

o The Lebanese electricity sector is governed by Law 462/2002: it envisions the establishment of an independent Energy Regulatory Authority (ERA) to oversee the sector and issue licenses to generate power. This law is purposefully poorly implemented and inhibits the sector's potential to operate effectively, instead allowing special interests to flourish. Indeed, no ERA was ever designated, hence rendering the Lebanese cabinet the self-appointed authority in this matter.<sup>5</sup>

<sup>1</sup> Bridging the banking crisis to crowdfund electricity reform in Lebanon

[https://www.aub.edu.lb/ifi/Pages/publications/research\\_reports/2020-2021/20211020\\_comprehensive\\_solution\\_to\\_the\\_lebanese\\_electricity\\_sector\\_report\\_pdf.aspx](https://www.aub.edu.lb/ifi/Pages/publications/research_reports/2020-2021/20211020_comprehensive_solution_to_the_lebanese_electricity_sector_report_pdf.aspx)

<sup>2</sup> Alterman, Jon B, Natasha Hall, and Will Todman. "LEBANON." SUSTAINABLE STATES

<https://rowman.com/ISBN/9781538140376/Sustainable-States-Environment-Governance-and-the-Future-of-the-Middle-East>

<sup>3</sup> Lebanon electricity crisis: 'Disaster in the making' | Business and Economy News | Al Jazeera

<https://www.aljazeera.com/news/2021/6/11/lebanon-electricity-crisis-disaster-in-the-making>

<sup>4</sup> Lebanon power sector emergency action plan

<https://documents1.worldbank.org/curated/en/500281593636676732/pdf/Lebanon-Power-Sector-Emergency-Action-Plan.pdf>

<sup>5</sup> Renewable Energy in Lebanon: Can the Country Embrace its Resources Sustainably? | Heinrich-Böll-Stiftung | Lebanon - Beirut

<https://lb.boell.org/en/2019/03/01/renewable-energy-lebanon-can-country-embrace-its-resources-sustainably>

- o In spite of this, the Lebanese government has repeatedly asserted its will to take sustainable and cost-effective measures to remedy the power cuts that have pervaded in Lebanon for nearly three decades. Much of these claims are based on a 2010 strategy document by then energy minister Gebran Bassil, who stated that the sector's losses will be eliminated by 2014, and that the sector would become profitable by 2015.<sup>6</sup>  
However, not much of the plan was ultimately implemented. Between 2013 and 2018, three Turkish power barges by the privately owned Karadeniz Energy Group, which require fuel oil and diesel to be operational, were brought in and anchored on shore in order to restrain energy deficits; they account for roughly a quarter of Lebanon's power generation capacity.<sup>7</sup>
- o In light of these deficits, Lebanese citizens have turned towards generators to supply their homes with power, and the generator market is estimated to be between \$1.5 and \$2 billion in size.<sup>8</sup>
- o The international community, the International Monetary Fund (IMF) in particular, has frequently urged Lebanese authorities to legislate economic reforms necessary to benefit from the billions of dollars necessary to finance its developmental projects.<sup>9</sup>  
These demands include optimizing the amount of electricity generation and distribution, boosting power capacity through the creation of new power plants, and raising electricity pricing.<sup>10</sup>

## Lebanese–Egypt Gas Deal

- o Lebanon, deeply embroiled within a grave financial crisis, is looking to purchase electricity from Arab neighbors to help alleviate the severe shortfall in power. Thus, as per an U.S. backed agreement between Lebanon, Egypt, Jordan, and Syria initially proposed in September 2021, Egyptian gas will be supplied through the Arab Gas Pipeline from Homs to Deir Ammar.<sup>11</sup>  
Lebanon hopes to generate 450 megawatts from this arrangement, and is working with the World Bank to secure required funding.<sup>12</sup>
- o Concerns arose over the U.S. sanctions imposed on the Syrian government since 2019 when Egyptian Minister of Petroleum and Mineral Resources Tarek El Molla inquired into the potential penalties that Egypt's involvement might bring about, requiring Lebanese authorities to request an exception from Washington; Damascus has attested its willingness to collaborate. Indeed, as per the Caesar Act, the U.S. is able to punish third-party companies who conduct business with Syrian authorities—particularly within the energy and engineering sectors. However, back in October, senior State Department official Victoria Nuland attests that since this deal falls within the humanitarian category, no sanctions should be necessary. Furthermore, for its cooperation, the Syrian state will be compensated in-kind instead of in cash payments.<sup>13</sup>  
Nevertheless, for the Republican party in particular, there remains an ongoing controversy over normalizing relationships with Syria and Bashar al-Assad's government, and how other involved parties—notably Hezbollah—stand to benefit from this arrangement.<sup>14</sup>

<sup>6</sup> Lebanon electricity crisis: 'Disaster in the making' | Business and Economy News | Al Jazeera

<https://www.aljazeera.com/news/2021/6/11/lebanon-electricity-crisis-disaster-in-the-making>

<sup>7</sup> Plagued by cuts, Lebanon survives on floating power plants

<https://apnews.com/article/20e21b2c469c4653ae32167f15ac631c>

<sup>8</sup> lebanon power sector emergency action plan

<https://documents1.worldbank.org/curated/en/500281593636676732/pdf/Lebanon-Power-Sector-Emergency-Action-Plan.pdf>

<sup>9</sup> Lebanon electricity crisis: 'Disaster in the making' | Business and Economy News | Al Jazeera

<https://www.aljazeera.com/news/2021/6/11/lebanon-electricity-crisis-disaster-in-the-making>

<sup>10</sup> Alterman, Jon B., Natasha Hall, and Will Todman. "LEBANON." SUSTAINABLE STATES

<https://rowman.com/ISBN/9781538140376/Sustainable-States-Environment-Governance-and-the-Future-of-the-Middle-East>

<sup>11</sup> Lebanon Denies it Will Import Israeli Gas Through Egypt | Asharq AL-awsat

<https://english.aawsat.com/home/article/3419651/lebanon-denies-it-will-import-israeli-gas-through-egypt>

<sup>12</sup> Lebanon to get Egyptian gas via Syria in plan to ease crisis | Reuters

<https://www.reuters.com/business/energy/egypt-says-it-hopes-export-gas-supply-lebanon-with-power-soon-2021-09-08/>

<sup>13</sup> US alleviates Lebanon's sanctions concerns over energy deal - Al-Monitor: The Pulse of the Middle East

<https://www.al-monitor.com/originals/2022/01/us-alleviates-lebanons-sanctions-concerns-over-energy-deal>

<sup>14</sup> Thorny politics surround Lebanon's Egyptian-Syrian-Jordanian gas deal - L'Orient Today

<https://today.lorientlejour.com/article/1287832/thorny-politics-surround-lebanons-egyptian-syrian-jordanian-gas-deal.html>

# Recommendations

- o Lebanon has a lot of impetus to investigate and venture into renewable energy sources especially due to its commitment to generate 30% of its energy production from renewables by 2030, per The Paris Agreement of 2015<sup>15</sup> and possesses the potential to adopt them efficiently and sustainably to stop relying on the costlier fuel and diesel oil that feed its power plants.

## In the immediate term

### Ensure that the Egyptian gas deal goes through.

Presently, the Egyptian gas deal presents Lebanon with the most viable solution to avoid the country's total collapse, and this is to the benefit of all parties involved. For instance, a staffer in the U.S. Democratic party claimed U.S. foreign policy's gains in assisting Lebanon in resolving its electrical crisis and further destabilization exceed any indirect advantages that the Syrian regime might obtain from the agreement.<sup>16</sup>

The deal will bring roughly 650 million m<sup>3</sup> of natural gas-the cleanest kind of fossil fuel<sup>17</sup> into Lebanon to generate 450 MW of electricity, at the advantageous rate of 7.5 to 8 cents per kWh. However, this arrangement remains a band-aid solution; thus, it is critical that Lebanon assesses long-term, sustainable decisions to stabilize its electricity sector.

## In the Short to Medium Term

### Implement and follow existing legislative frameworks to boost efficiency, profitability, and transparency.

The proper implementation of Law 462, and consequently, the establishment of an ERA would represent a significant step forward in the reform of the Lebanese electricity industry in the form of the decentralized production, transmission, and collection of electricity within the confines of the law.<sup>18</sup>

### Strengthen the governance of EDL.

This would be consistent with the 2020 Emergency Action Plan issued by the World Bank, and would entail the creation of a contract between EDL and the government outlining a five-year plan that includes detailed performance goals and compliance requirements, in addition to modernizing EDL's operations and privatizing its generation plants.<sup>19</sup>

### Issuance of licenses and authorization for Power Purchase Agreements (PPA) by the ERA.

With the assumption that the ERA will be set up, members' responsibilities and powers will vary from ensuring and encouraging competition in the electricity sector, supervising and controlling non-competitive tariffs, and ensuring the transparency of the market. ERA will also have the responsibility of issuing licenses and authorizations. Licensing private companies to generate electricity from renewable energy resources through direct proposal submission will spur public-private partnership and will help reduce the burden on EDL.

### Incentivize the private sector through dedicated solar energy funds leveraged by international support to increase solar energy investment in Lebanon.

Lebanon benefits from 300 days of sun a year, which roughly amounts to 3000 hours of sunshine a year. The estimated cost of production of solar energy is also more cost-effective, amounting to \$.04-\$.05/kWh for utility scale projects.<sup>20</sup> Furthermore, solar power has already been successfully implemented in some small-scale sites, with promising results.

<sup>15</sup> The Paris Agreement | UNFCCC

<https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

<sup>16</sup> Thorny politics surround Lebanon's Egyptian-Syrian-Jordanian gas deal - L'Orient Today

<https://apnews.com/article/20e21b2c469c4653ae32167f15ac631c>

<sup>17</sup> Natural gas environmental impact: problems and benefits

<https://group.met.com/en/mind-the-fyouture/mindthefyouture/natural-gas-environmental-impact#:~:text=Natural%20gas%20is%20the%20most,life%20cycle%20into%20the%20atmosphere>

<sup>18</sup> Renewable Energy in Lebanon: Can the Country Embrace its Resources Sustainably? | Heinrich-Böll-Stiftung | Lebanon - Beirut

<https://lb.boell.org/en/2019/03/01/renewable-energy-lebanon-can-country-embrace-its-resources-sustainably>

<sup>19</sup> Lebanon power sector emergency action plan

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## **Install solar panels on the rooftops of school buildings as a means to support the education sector and provide these educational institutions with their required energy needs.**

Schools are struggling with equipping themselves with their energy needs and this is putting at risk the education of thousands of children. Installing solar PV on school rooftops will adequately supply them with energy and is the best alternative since schools are open only part time during the day and are closed in the summer. In Qabrikha, South Lebanon, several local public schools and hospitals were donned with a hybrid system that incorporated generators and solar energy; based on its successful integration, the initiative predicted a decrease in the costs of battery storage systems, as well as that of the dependence on generators. It also ensured that the energy needs of such institutions were met.<sup>21</sup>

## **Utilize existing microgrids of back-up generators to scale-up solar energy in the short term.**

Given their extensive network and efficiency when it comes to supply and cost, the existing microgrids hold significant potential in being used for solar energy. Due to their current illegal state, it is unlikely that these micro grids will be feasible for investment, especially from international donors. However, if these generators along with their grids were to be bought out and transferred towards the municipality, there is potential for further investment.

By allocating the production, distribution, and bill collection to the municipality, hence at a decentralized level, this reduces the burden on EdL and will allow municipalities to up-scale solar energy and other renewables. Dealing with legitimate institutions, such as municipalities, will also provide ability for investment. Currently, municipalities cannot take loans to scale up these investments. Therefore, laws linked to decentralization to allow municipalities to undertake such projects need to be formulated and implemented as soon as possible.

## **Embrace wind energy as a power source.**

The National Wind Atlas of Lebanon, a 2011 U.N. report, estimates that Lebanon could potentially generate 5,400 megawatts of wind energy.<sup>22</sup>

The levelized cost of electricity is approximated at around USD 7.8 cents per kWh in optimal weather conditions; combined with a selling price of USD 10.75 cents/kWh fixed by existing wind farms in Akkar, the viability and profitability of this venture is ensured.<sup>23</sup>

## **Pave the way (by the government) for smart and clean grid solutions through modernizing and stabilizing the grid.**

Lebanon's grid is subject to major technical and non-technical losses. Modernizing the grid can provide greater quantities of zero-to-low-carbon electricity reliably and securely, including handling the intermittency of renewables like solar and wind power. In addition, investment in base load power is a prerequisite to scale up renewable energy and reach our 2030 targets. This can be achieved with gas-fired power plants or storage if financially efficient.

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<sup>21</sup> Sustainable Impacts of Energy Projects on Livelihoods, Education and Health  
<https://data2.unhcr.org/es/documents/download/66478>

<sup>22</sup> The National Wind Atlas of Lebanon  
[https://www.lb.undp.org/content/lebanon/en/home/library/environment\\_energy/the-national-wind-atlas-of-lebanon.html](https://www.lb.undp.org/content/lebanon/en/home/library/environment_energy/the-national-wind-atlas-of-lebanon.html)

<sup>23</sup> Renewable Energy in Lebanon: Can the Country Embrace its Resources Sustainably? | Heinrich-Böll-Stiftung | Lebanon - Beirut  
<https://lb.boell.org/en/2019/03/01/renewable-energy-lebanon-can-country-embrace-its-resources-sustainably>