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The Role of MSMEs in the Context of the Clean Energy Transition in MENA: The Lebanon Case Study

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Note: This report is based on data collected between October 2023 and July 2024, reflecting the MSME landscape and stakeholder perspectives at that time. The information contained in this report, as well as the proposed recommendations, do not fully reflect the impact of recent conflict-related destruction and displacement.

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Background

This report presents a qualitative and quantitative data analysis that has been conducted as part of a case study for Lebanon under the r*esearch project entitled 'The Role of MSMEs in Fostering Inclusive and Equitable Sustainable Economic Growth in the Context of the Clean Energy Transition in MENA*.' The objective of this project, which is funded by the International Development Research Center (IDRC), is to enhance our understanding of the energy transition in six Middle East and North Africa (MENA) countries, including Egypt, Jordan, Lebanon, Morocco, Sudan, and Tunisia, in a way that contributes to the building and promotion of strategic and evidence-based policies that address energy challenges in the region. The essential question that drives this research is: 'How can the energy transition in these countries be made more equitable and sustainable?'

From the broad scope of research that this question delineates, the project focuses on a specific group of economic units that include micro, small, and medium enterprises (MSMEs). In each of the six case studies, these enterprises are considered the backbone of the local economy. Understanding the energy transition in these six countries thus cannot be achieved outside this frame, within which we examine the interplay between MSMEs and the evolving energy landscape. In other words, embedded in the study's central question stated above are several areas of inquiry aimed at uncovering how these entities are impacted by the ecological disruptions caused by climate change, both in the literal sense and in the realm of energy, public policy, and economic development.

The objective of this project is not just the mere creation of knowledge, but, along with that, an attempt to shape public policy and inspire government action capable of optimizing the energy transition, both economically and environmentally. For that reason, the research will explore possible incentive structures that can be developed to potentiate MSMEs with proactive and constructive agency as their countries transition to more sustainable sources of energy.

With regards to 'sustainability,' this research examines the energy sector and strategy and, within it, the policy response to climate change in each of the six case studies. As for 'equity,' the study focuses on the two widest demographic categories impacted by systemic and structural disenfranchisement, i.e., women and youth. In clearer terms, the primary data collected during this project will attempt to measure

gender and age gaps in those societies in relation to employment opportunities, professional mobility, access to financing opportunities, and social and economic inclusiveness in the broader sense, all in the context of the energy transition.

The MENA region is experiencing the impact of climate change, with temperatures increasing by about 1.5°C in the last three decades, around twice the global average in previous years (0.70°C). Climate hazards such as flash floods and extreme temperatures have become especially frequent in the Middle East. Water scarcity is also prevalent in this region, which hosts 18 water-poor countries. Whether by the use of dams, water pumps, or desalination technologies, ensuring water supply to the expanding urban areas in those countries is becoming reliant on energy intensive processes. Population growth has also led to a steady increase in demand on energy, especially in growing economies where *demand induced scarcity*[1] is the biggest energy challenge.

Simultaneously, access to energy is becoming more challenging in this unstable climate reality, particularly for energy-importing countries in the region. This makes the transition to clean energy in MENA a vital one. Luckily, the region has comparative advantages, given the natural endowments of high solar radiation and strong wind nodes throughout the year. Besides, renewable energy (RE) is today's cheapest power option and continues to get cheaper. The importance of this transition in MENA lies in the need to meet the region's growing energy demand at affordable prices, promote inclusive and sustainable development, create new jobs while adhering to climate change mitigation and adaptation policies, and build climate change resilience.

In Lebanon, successive governments in the post-war period (starting 1990) have failed to either rebuild the country's power production infrastructure or stimulate the domestic energy sector, much less develop a sustainable energy strategy. The ongoing economic crisis has increased pressures on the sector, leading to the near collapse of the public utility company Electricité du Liban (EDL), which resulted in constant power outages, unreliable supply, and inequitable access to energy, all of which came at a detrimental cost for households and local businesses.

The country also stands at a very critical point when it comes to its readiness and ability to face climate change impacts and mitigate them.[2] In these interlocking regional contexts, both locally and regionally,

1 'Demand-induced scarcity' is a concept that outlines the economic implications of limited availability of resources/commodities when coupled with a continuously growing demand, driven by population growth, increasing income/purchasing power, or other particular events. When applied to energy, and unlike other commodities, the concept reveals a problem of great complexity and leaves countries vulnerable to unmatched supply-demand implications.

2 World Bank (2024). Lebanon Country Climate and Development Report. Open Knowledge Repository (worldbank.org).

medium, small, and micro enterprises (MSMEs) play a significant economic role. These enterprises comprise 80-90% of businesses in MENA economies and up to 95% of businesses in Lebanon's economy. It is, therefore, crucial to understand the challenges and opportunities they face, their prospects for job creation, their enhancement of climate resilience, and empowerment of women and youth. For MSMEs working in Lebanon, transitioning to renewable sources of energy means securing access to an affordable and reliable supply of electricity that is not subject to market volatility.

Introduction

The Lebanon case study will focus on how MSMEs are adjusting to the phasing out of energy subsidies and the reversal of the country's heavy reliance on fossil fuels amid a rapid widespread installment of RE systems, most commonly solar (photovoltaic). It will investigate the current policy and regulatory frameworks that can boost this decentralized transition and examine governance structures at the central and local levels. Yet, it will not only focus on the MSMEs working within the energy sector, but also covers some sectors that have flourished in recent years despite the crisis, particularly the agri-food sector.

This research uses a multidisciplinary approach that considers several other relevant socio-economic characteristics as part of its quantitative work (such as income and level of education), while trying to investigate the involvement of women and youth in the current transition processes.

Historically, Lebanon lacked a formal unified definition of small and medium enterprises. Public and private sector entities developed definitions that suited their requirements. For instance, Banque du Liban (BDL), Lebanon's central bank, defines MSMEs as enterprises with less than LBP 15 billion in annual turnover, while Kafalat[3] defines MSMEs as having less than 40 employees.[4]

More commonly, small and medium enterprises (SMEs) are defined based on specific criteria related to the number of employees and annual turnover. The classification includes micro, small, and medium enterprises, each with distinct thresholds. A micro enterprise is characterized by having less than LBP 500 million in annual turnover[5] and fewer than 10 employees. Small enterprises fall within the range of less than LBP 5 billion turnover and less than 50 employees.

3 Kafalat is a Lebanese financial company with a public concern that assists small and medium sized enterprises (SMEs) to access commercial bank funding. Loans guaranteed by Kafalat benefit from interest rate subsidy.

4 UNDP (2015). Lebanon's SME Strategy. https://www.undp.org/lebanon/publications/lebanons-sme-strategy

5 Considering the pre-crisis exchange rate prior to currency devaluation of 1,500 LBP for 1 USD.

Medium enterprises, on the other hand, have turnover below LBP 25 billion and employ fewer than 100 individuals.[6] It is essential for an enterprise to meet both the turnover and employee thresholds to be categorized accordingly. If a business exceeds either dimension, it would move into the next category.

MSMEs play a significant role in Lebanon's economy, constituting nearly 95% of all enterprises in the country, based on these defined parameters.[7] Yet, and although there is still no official definition for MSMEs, the aforementioned categories and thresholds have been informally followed by relevant stakeholders, including ministries. In addition, accurate data on operating MSMEs in the country and their sectoral distribution and evolution is not publicly available, and is scattered across several related ministries, associations of industrialists, regional Chambers of Commerce, among others.

The legal framework for MSMEs in Lebanon is crucial in providing the necessary support and guidance for the growth and development of this sector. It has been reported that a draft law that tackles MSMEs and their operations is awaiting government approval.[8] The sectorial consideration of MSMEs in Lebanon means that there are specific laws and regulations that cater to the unique needs and challenges faced by small and medium enterprises. These laws not only define the criteria for categorizing MSMEs based on their size and turnover, but also outline the various initiatives and programs aimed at supporting and promoting the growth of MSMEs in different sectors of the economy.

SMEs are required to register their businesses with the Ministry of Economy and Commerce, a process that involves providing necessary documentation such as proof of identity, business plans, and financial statements. Taxation is another crucial aspect for MSMEs in Lebanon, as they are subject to corporate income tax, value-added tax (VAT), and other applicable taxes based on their business activities.[9] Understanding and complying with tax laws is essential to avoid penalties and legal issues.

Lebanese labor laws govern the relationship between employers and employees in MSMEs, covering aspects such as working hours, wages, benefits, and employee rights. Adhering to labor regulations is crucial for MSMEs to ensure a fair and legal working environment. Protecting intellectual property rights is also vital for MSMEs in Lebanon to safeguard their innovations, trademarks, and copyrights. Registering

6 UNDP (2015). Lebanon's SME Strategy. https://www.undp.org/lebanon/publications/lebanons-sme-strategy

7 Ibid.

8 Interview with the Ministry of Economy and Trade (MoET, 2024).

9 Cesar Antoine Kamel, Jeanne Antonios Kaspard and Fleur Clara Khalil, 'The Information System of Lebanese Exporting SMEs' (2023) 11 Journal of Law and Sustainable Development. https://ojs.journalsdg.org/jlss/article/view/1212

patents or trademarks can help MSMEs prevent infringement and protect their assets.

SMEs often engage in commercial contracts with suppliers, customers, and partners. Understanding contract laws and ensuring the legality of agreements is essential to avoid disputes and legal challenges. For MSMEs involved in export activities, compliance with export regulations is critical. Understanding trade laws, customs procedures, and export documentation requirements is essential for MSMEs to navigate international markets successfully. This shows the multifaceted role of MSMEs.

On the other hand, access to finance is crucial for MSMEs' growth and sustainability. Understanding banking regulations, loan options, and financial management practices can help MSMEs secure funding and manage their finances effectively. While there may not be a specific legal framework exclusively dedicated to MSMEs in Lebanon, MSMEs must comply with existing laws and regulations that govern business operations. Seeking legal advice, staying informed about regulatory changes, and maintaining compliance with applicable laws are essential for MSMEs to operate legally and sustainably in Lebanon's business environment.

SMEs were the heartbeat of the Lebanese economy before the 2019 crisis. They acted as crucial engines for employment generation, economic diversification, and social cohesion. Comprising more than 90% of businesses in Lebanon, MSMEs were a dominant force contributing to around 50% of the country's total GDP.[10] This translates to hundreds of thousands finding work, in addition to serving as a vital safety net against unemployment, especially for youth and women who face higher unemployment rates. Notably, micro-enterprises constituted the majority (73%), followed by small enterprises (20%), and (3.5%) for large and medium enterprises.[11]

This economic contribution wasn't just about numbers. MSMEs operated in a wide range of industries. The majority of MSME turnover is concentrated in wholesale, retail trade, and repairs (57%), followed by real estate, renting, and business activities (14%), manufacturing (11%), construction (5%), transport, storage, and communications (4%), hotels and restaurants (4%), financial intermediation (2%), and other sectors (3%).[12] This diversity bolstered the economy and lessened reliance on specific sectors, making it more resilient against external shocks.

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Farran. I, Fawaz. M., Role of SMEs in Lebanese Economy. Journal of Economics and Management Sciences. 2018. https://www.researchgate.net/publication/327918417_Role_of_SMEs_in_Lebanese_Economy

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Matta, J. M/SMEs in Lebanon. Status, Strategy and Outcomes (2018). Ministry of Economy and Trade. https://www.economy.gov.lb/media/11222/smes-in-lebanon-180412-19-website.pdf

12
Ibid.

I Overview on MSMEs in Lebanon

The economic crisis that began in 2019 has posed unprecedented challenges for MSMEs, threatening their survival and sustainability. This literature review will analyze the role of MSMEs in Lebanon both before and after the crisis, examining the legal framework governing this sector, the challenges faced by MSMEs, and the impact of the economic crisis on their operations. By exploring the evolution of MSMEs in Lebanon and the current challenges they face, we aim to shed light on the importance of supporting and strengthening this vital sector in the Lebanese economy.

Pre-Crisis Complex Web of Challenges

Lebanese MSMEs faced a complex web of challenges hindering their growth and prosperity, making it difficult for them to thrive in the competitive market environment. A broader economic slowdown between 2011 and 2015 led to approximately $18.5 billion in GDP losses, resulting in reduced consumer demand, limited access to credit, and business closures.[13] Burdensome regulations and administrative procedures add to the challenges, consuming resources and causing uncertainty, particularly for women entrepreneurs who face discriminatory practices and lack access to networks and mentorship opportunities. It is also important to mention the absence of core sectoral reforms and infrastructural bottlenecks that exacerbated the ease of doing business during those years.

One of the primary challenges faced by businesses in Lebanon is the significant skill gap, where 41% of firms believe that their employees' education does not match their current roles.[14] This mismatch makes it difficult to find skilled professionals, such as accountants or financial advisors, crucial for providing strategic financial advice and accessing funding from financial institutions that require certified expertise. In regions like Beirut and Mount Lebanon, businesses struggle due to inadequate support services, hindering research for business plans and marketing strategies. The absence of essential resources like training and mentorship programs further complicates decision-making and market intelligence gathering, ultimately hampering growth and competitiveness.[15]

Limited market access compounds the problem, increasing uncertainty about international market standards. Infrastructure deficits, especially in rural areas, impede operational efficiency, hinder market expansion,

13 Matta, J. M/SMEs in Lebanon. Status, Strategy and Outcomes (2018). Ministry of Economy and Trade. https://www.economy.gov.lb/media/11222/smes-in-lebanon-180412-19-website.pdf

14 Matta, J. M/SMEs in Lebanon. Status, Strategy and Outcomes (2018). Ministry of Economy and Trade. https://www.economy.gov.lb/media/11222/smes-in-lebanon-180412-19-website.pdf

15 'Market Overview of Small and Medium Enterprises in Beirut and Mount Lebanon: A Report by Building Markets for the International Rescue Committee (IRC)' (2016). https://www.rescue.org/sites/default/files/document/656/ircandbuildingmarketssmemarketoverviewlebanonrelease.pdf

and restrict adoption of digital technologies. Complex regulatory frameworks further burden MSMEs, causing delays, additional costs, and legal uncertainties that stifle growth.

Environmental pressures, including climate change and urbanization, demand optimal resource management solutions. However, challenges in adopting clean technologies and attracting investment persist, compounded by difficulties in securing loans and credit, forcing businesses to rely on unsustainable financing sources. Kafalat, Lebanon's financial services company, has historically supported MSME growth, guaranteeing loans totaling USD 515 million by the end of 2019, with 37% allocated to the agro-food sector.[16]

According to the 2020 World Bank's ease of doing business report, Lebanon ranked 143rd out of 190 economies—a score of 54.3 out of 100.[17] It is important to note that the data collected for the reporting was based on pre-crisis indicators. The ranking applies 10 indicators to measure the overall ease of doing business in the country, namely (1) Starting a Business, (2) Dealing with Construction Permits, (3) Getting Electricity, (4) Registering Property, (5) Getting Credit, (6) Protecting Minority Investors, (7) Paying Taxes, (8) Trading across Borders, (9) Enforcing Contracts, and (10) Resolving Insolvency.

The social, economic, infrastructural and political developments that resulted from the recent crises (described more in the following sections) have significantly altered most, if not all, of these indicators. Particularly, major changes in the indicators of getting electricity, getting credit, and paying taxes are expected. Yet, the indicators (as well as the country's score) reflected that the MSMEs' business environment was already struggling due to structural macroeconomic considerations that are linked to the deep rooted, clientelism-based, and rent-seeking economic model that developed after the civil war. These structural factors and bottlenecks combined have prevented MSMEs from thriving during the post-civil war reconstruction period.

Post-Crisis Era: COVID-19, Economic Crisis, Regional Conflicts, and Impact on MSMEs

Lebanon's case is unique when it comes to institutional and corporate relations with crises. Since the civil war era (1976–1990) until the present day, the business-as-usual scenario for MSMEs can best be described as 'perpetual crisis operating mentality.'[18] That is, and contrary to most literature on businesses operating under a singular

16 Daoud, Barbara. (2019). Financing Lebanon's Agro-food Sector: An analysis of the Sector Before and After October 2019. https://pdf.usaid.gov/pdf_docs/PA00XDCT.pdf

17 World Bank Group. Economy Profile Lebanon. Comparing Business Regulation in 190 Economies. (2020). https://documents1.worldbank.org/curated/en/449901575011500225/pdf/Doing-Business-2020-Comparing-Business-Regulation-in-190-Economies-Economy-Profile-of-Lebanon.pdf

18 Maalouf et. al. (2023), Business Survival Strategies in a Polycrisis: SME Experiences from Beirut, Lebanon. Preprint for Business Horizons special issue.

crisis that they have to overcome, the case of Lebanese MSMEs is that of operating in perpetual and overlapping crises, with no expectation of reaching an enabling environment that is supportive and devoid of critical social, economic, or political issues.

In the period of 2019-2023, three main local and regional elements were added to the perpetual crises facing doing business in Lebanon. At the forefront of these, and most significant in terms of its impact, was the economic crisis, followed by the COVID-19 pandemic, and finally the Russia-Ukraine conflict and its impact on food prices.

For Daher (2022),[19] the root of the economic crises can be mainly attributed to the political economy of the country and how it evolved after the end of the civil war (1990). During that period, emphasis was placed on private sector growth and integration into the global economy with the banking, real estate, and services sectors being the focus areas of development. This model has been exacerbated by neo-liberal policies (sometimes described as sectarian neoliberalism[20]), which have made social inequality and regional inequities more noticeable. Through the various privatization programs and the clientelist distribution of state contracts, the policies primarily favored the economic and political elites of sectarian communities. These policies are directly related to the political economy of the nation being highly financialized and to the marginalization of significant sectors like industry and agriculture.[21]

The high cost of reconstructing the country's infrastructure after a devastating 15-year war led to widening state budget deficits, which in turn were financed by a rising public debt. The economic collapse started in October 2019 when capital inflows abruptly stopped, exposing the unsustainable nature of monetary, fiscal, and macroeconomic policies. The high debt load, which was 154% of GDP in 2018 and 171% in 2019 (prior to the crisis),[22] was largely carried by the Lebanese government and Lebanon's central bank (Banque du Liban-BDL).[23]

Since 2019, there has been a consistent decrease in fiscal receipts and expenditures, which has hindered the government's capacity to deliver crucial public services. The percentage of government revenues and primary expenditure in GDP fell to about a third of its pre-crisis levels, significantly restricting public sector activities, even though the economy has contracted by about 40%[24] and the Lebanese lira has lost 98 percent of its value. This was accompanied by hyperinflation that has reached 221,3% in 2023.[25] There has been a noticeable

19
Daher, Joseph. (2022). Lebanon: How the Post War's Political Economy Led to the Current Economic and Social Crisis. European University Institute (EUI). https://cadmus.eui.eu/bitstream/handle/1814/73856/QM-01-22-031-EN-N.pdf

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Rima Majed. https://www.tni.org/en/article/lebanon-and-iraq-in-2019

21
Daher, Joseph. (2022). Lebanon: How the Post War's Political Economy Led to the Current Economic and Social Crisis. European University Institute (EUI).

22
Brite Indicators and Trends. BlomInvest Bank s.a.l. https://brite.blominvestbank.com/series/Gross-Public-Debt-of-GDP-2929/

23
Hausmann et. al. (2023). Towards a Sustainable Recovery for Lebanon's Economy. Center for International Development at Harvard University.

24
International Monetary Fund. (2023). Country Report No. 23/237. LEBANON. https://doi.org/10.5089/9798400247668.002

25
Central Administration of Statistics. Annual Inflation Rate 2023. http://www.cas.gov.lb/index.php/latest-news-en/165-inflation-4

impact on access to administrative, power, and healthcare services. The main cause of the revenue fall has been a significant drop in income tax and value-added tax (VAT) collection. The main causes of the decrease in spending have been a sharp drop in real public sector pay and a notable decline in Electricité du Liban's (EdL) fuel imports (EDL's operation was heavily subsidized by the government).

The COVID-19 pandemic and the economic collapse in Lebanon have significantly exacerbated the challenges faced by MSMEs.

Lebanon experienced a severe economic downturn, with its GDP plummeting from nearly US$55 billion in 2018 to about US$21.8 billion in 2022.[26] The crisis worsened due to additional factors like the COVID-19 pandemic, the Beirut port explosion in 2020, and geopolitical tensions like the Russia-Ukraine conflict.

The financial crisis resulted in a notable decrease in bank loans, hitting MSMEs most severely. Reduced access to credit, typically obtained from banks, stemmed from liquidity challenges and heightened risk, prompting banks to scale back lending activities due to the financial crisis. The war on Ukraine was another factor that had a compounding effect on inflation; between February and April 2022, inflation is predicted to have climbed mostly due to the global increase in the price of wheat and oil.[27]

Consequently, many MSMEs struggled to fulfill their financial obligations, invest in growth, and sustain operations. Alternative funding sources like personal networks are strained by the crisis. The banking sector's deleveraging process and stricter lending practices favoring larger clients further restrict access to credit for smaller businesses, creating a challenging funding environment for MSMEs, hindering their growth potential, and worsening economic difficulties.

Political turmoil and a collapsing currency created a perfect storm for businesses. Frequent protests disrupted supply chains, transportation, and access to workplaces, hindering daily operations and deterring potential investors. Public unease translated to decreased consumer spending, squeezing sales and revenue for MSMEs. The plummeting lira further compounded these challenges. It significantly inflated the cost of imported materials and equipment, pushing up production costs for MSMEs. This financial strain is further exacerbated by the struggle to manage dollar-denominated loans and contracts while earning revenue in lira, putting a heavy burden on businesses.

The World Bank paints a grim picture of Lebanon's economic crisis;

26 International Monetary Fund. (2023). Country Report No. 23/237. LEBANON. https://doi.org/10.5089/9798400247668.002

27 Mercy Corps. (2023). Effects of the Ukraine Conflict on Lebanon's Economic and Humanitarian Crisis - One Year On. https://reliefweb.int/report/lebanon/effects-ukraine-conflict-lebanons-economic-and-humanitarian-crisis-one-year

highlighting the permanent closure of one in five businesses[28] and a staggering rise in unemployment, jumping from 11.4% to 29.6% between 2018 and 2022.[29] This stark statistic reflects the devastating impact on livelihoods and businesses across the country. The situation was further compounded by the Beirut port explosion, which caused widespread damage to an estimated 90,000 properties in the city, adding another layer of hardship.[30]

The electricity crisis further burdens MSMEs as they incur high costs without reflecting them in selling prices, reducing profitability and increasing operational costs, making survival in the market increasingly challenging.

These combined challenges present a daunting landscape for MSMEs in post-crisis Lebanon, requiring comprehensive solutions and support mechanisms to facilitate recovery and sustainable growth.

Post-Crisis Realities: Divers, Thrivers, Resilience, and Adaptation among MSMEs

With this daunting landscape in mind, analyzing the diversity of factors that impacted business operation and how different MSMEs reacted and coped with the crisis can help in understanding the complex reality that ensued.

Among the main factors that impacted Lebanese MSME performance during the recent crisis is employee salary and its degree of change, which constituted a major factor in recent literature.[31] Salary changes and payment of salaries were shown to be related to shifts in working hours, business liquidity, changes in customer demand, and positively correlated to pricing, sales, business profitability, and the resiliency of the organization. It is also important to mention the accompanying brutal liberalization and subsidy removal on all basic services, in particular the abrupt increase of energy prices (electricity, gasoline, and diesel). Nonetheless, existing literature state no correlation between (1) the performance of the MSME (during the crises) and the sector in which it operates, (2) the location of the firm and the resiliency of the organization, and (3) skills of owners and profitability.[32]

However, some of these findings may be found to contradict recent Mercy Corps and UNDP studies on coping with the crises. These studies reported that 'firms working in trade and manufacturing were more likely to be hard hit by the crisis compared to firms in the service sector, at least in the short-term,' while 'firms with educated owners were more

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World Bank (2021). Lebanon Economic Monitor: Lebanon Sinking (To the Top 3). https://www.worldbank.org/en/country/lebanon/publication/lebanon-economic-monitor-spring-2021-lebanon-sinking-to-the-top-3

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CAS. ILO. Lebanon Follow Up Labour Force Survey 2022. https://www.ilo.org/resource/news/lebanon-and-ilo-release-date-data-national-labour-market

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'American University of Beirut' (American University of Beirut, 2020). <https://www.aub.edu.lb/osb/news/Pages/SMEs-in-Lebanon.aspx

31
Attieh. (2022). Entrepreneurship and Resilience in Times of Crises: The Case of SME's in Lebanon; Ghayad et. al. (2023). What are the Challenges that SMEs have Faced During the Financial Crisis in Lebanon?;bWahidi et. al. (2024), Unveiling the Resilience of Lebanese SMEs: The Effects of Multiple Crises on Its Performance.

32
Attieh. (2022). Entrepreneurship and Resilience in Times of Crises: The Case of SME's in Lebanon; Ghayad et. al. (2023). What are the Challenges that SMEs have Faced During the Financial Crisis in Lebanon?; Wahidi et. al. (2024), Unveiling the Resilience of Lebanese SMEs: The Effects of Multiple Crises on Its Performance.

likely to adapt to the crisis.'[33] On the other hand, 'the wholesale and retail trade sector, manufacturing (including agri-food processing and cultural and creative industries), ICT and business professional services, and travel and tourism sectors… have shown better resilience to the crisis and offer feasible economic opportunities for young entrepreneurs.'[34] Some MSMEs have even become more self-dependent as entrepreneurs, becoming their own suppliers due to crisis-induced market changes.[35]

This difference in findings might be due to a scale or temporality issue (short-term vs. long-term impacts), nonetheless, it points to the need for additional research with detailed methodologies to capture the factors that relate to business success or continuity within the current Lebanese context.

With regard to MSME size and its relationship to business continuity and impact, Wahidi et al. highlighted that smaller firms maneuver better in times of crisis, and that is due to their ability to better adapt to specialization, their proximity to markets, their ability to better exploit new opportunities, their ability to build on community connections and networks, and their ability to adapt to leaner models when revenues decline.[36] However, these findings are context and sector specific as well.[37] Compared to large enterprises, MSMEs have less access to finance, a more limited client base, and are less equipped to handle disruptions (arguing that business size correlates with survival).[38] As claimed by Lai et al, smaller businesses typically have fewer resources and are less able to influence their external environment,[39] which relates to the World Bank reporting of the closure of 1 in 5 Lebanese businesses in the period between 2018 and 2022.[40]

This shows that there are multiple factors (both internal and external to the enterprise) that can play a role in the adaptability and the continuity of business for various types of MSMEs and that reacting and overcoming one crisis is quite distinct to reacting and continuing operations in a perpetual crisis situation (manage through a crisis vs manage within 'crisis as a condition'[41]).

Some Lebanese MSMEs have proven themselves to be remarkably adaptable in the face of crisis. This resilience is evident in their diverse strategies for survival and growth. When faced with lockdowns, businesses across sectors moved quickly to implement delivery services and improve their management and marketing practices.

Innovation was also a key weapon in their arsenal. According to the Ministry of Economy and Trade, around 3,350 trademarks were

33
Mercy Corps (2022). How can small businesses cope in the face of multiple crises in Lebanon?

34
Building Resilience in a protected crisis: Transforming Challenges into Opportunities for the Youth of Lebanon 2 Disclaimer (n.d.). Retrieved March 31, 2024, from https://www.undp.org/sites/g/files/zskgke326/files/2023-09/building_resilience_in_a_protracted_crisis-_youth_report.pdf

35
Interview with an MSME owner (Interviewee 14, 2024).

36
Wahidi et. al. (2024), Unveiling the Resilience of Lebanese SMEs: The Effects of Multiple Crises on Its Performance; Maalouf et. al. (2023), Business Survival Strategies in a Polycrisis: SME Experiences from Beirut, Lebanon. Preprint for Business Horizons special issue; Mercy Corps (2022). How can small businesses cope in the face of multiple crises in Lebanon?

37
Harries T, McEwen L and Wragg A (2018), Why it takes an 'ontological shock' to prompt increases in small firm resilience: Sensemaking, emotions and flood risk. International Small Business Journal 36(6): 712-733.

38
Maalouf et. al. (2023), Business Survival Strategies in a Polycrisis: SME Experiences from Beirut, Lebanon. Preprint for Business Horizons special issue.

39
Lai Y, Saridakis G, Blackburn R and Johnstone S (2016), Are the HR responses of small firms different from large firms in times of recession? Journal of Business Venturing, 31(1): 113-131.

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World Bank. 2021. Lebanon Economic Monitor: Lebanon Sinking (To the Top 3). https://www.worldbank.org/en/country/lebanon/publication/lebanon-economic-monitor-spring-2021-lebanon-sinking-to-the-top-3

41
Maalouf et. al. (2023), Business Survival Strategies in a Polycrisis: SME Experiences from Beirut, Lebanon. Preprint for Business Horizons special issue.

registered in 2021 alone, suggesting some level of business and innovation in the sector.[42] In one study, 28% to 36% of businesses introduced entirely new or improved products and services.[43] This diversification wasn't limited to just offerings; the agro-food sector, for example, saw businesses adapt their product lines to better suit changing market conditions. Similarly, the tourism industry shifted its focus to attract new customer segments, such as domestic tourists and remote workers seeking alternative work locations.

These diversification efforts haven't just helped businesses weather the storm; in the manufacturing sector, 60% of surveyed enterprises reported increased profitability after expanding their product lines.[44] Lebanese exports to the EU were highest during 2023.[45] Maalouf et. al. apply the concept of 'positive chaos' to describe how some MSMEs in Beirut used the 'polycrisis' as an opportunity to flourish, with examples on the enhanced ability of some firms to pay back their loans due to the currency devaluation and the use of networks to capitalize on new opportunities that the crises created.[46] They also report that for other firms that have typically struggled the most, a 'limit to resiliency' can be reached that can place a firm in a state of resignation to the crises.[47] Yet, these temporary gains that have no doubt benefitted some MSMEs are starting to fade out and soften with the ongoing dollarization of the economy and hyperinflation.

Conducting surveys across the country, Mercy Corps distinguished between 'thriver' MSMEs and 'diver' MSMEs, and reported that as a last resort to save their company, divers tried to innovate, but they lacked the prior capability, strategy, knowledge, or capital to make their innovation successful. In contrast, thrivers were able to capitalize on the crisis as a possibility for import substitution and to deliver services or products that have greater need during the crises.[48]

This all paints a picture of Lebanese MSMEs not just surviving hardship, but actively using it as a springboard for innovation and growth. However, their success in navigating these challenges wasn't solely due to their own efforts. A collaborative approach involving the ministries, international organizations, and the private sector has played a crucial role in supporting them.

International organizations have been playing a significant role. Training programs offered by the Ministry of Labor in collaboration with international organizations like the International Labor Organization (ILO) equipped MSMEs with essential skills in areas like digital marketing

42
According to an interview with the Ministry of Economy and Trade (MoET/Interviewee 12, 2024).

43
Latifa Attieh, 'Entrepreneurship and Resilience in Times of Crises: The Case of SMES in Lebanon' (2022) 11 Entrepreneurship & Organization Management 1. https://www.hilarispublisher.com/open-access/entrepreneurship-and-resilience-in-times-of-crises-the-case-of-smes-in-lebanon-91542.html

44
Latifa Attieh, 'Entrepreneurship and Resilience in Times of Crises: The Case of SMES in Lebanon' (2022) 11 Entrepreneurship & Organization Management 1. https://www.hilarispublisher.com/open-access/entrepreneurship-and-resilience-in-times-of-crises-the-case-of-smes-in-lebanon-91542.html

45
Interview with the Ministry of Economy and Trade (Interviewee 12, 2024).

46
Maalouf et. al. (2023), Business Survival Strategies in a Polycrisis: SME Experiences from Beirut, Lebanon. Preprint for Business Horizons special issue.

47
Ibid.

48
Mercy Corps (2022). How can small businesses cope in the face of multiple crises in Lebanon?

and financial management. The World Bank provided technical assistance to the Lebanese government in developing policies and programs specifically aimed at supporting MSMEs during the crisis. This includes conducting research and providing recommendations on improving the business environment and facilitating access to finance. Additionally, the European Union offered financial support through grants and loans for innovation, business development, and adaptation to new technologies and market demands.

The private sector has also stepped up its contributions. Business associations and chambers of commerce have launched mentorship programs connecting experienced entrepreneurs with aspiring MSME owners, providing valuable guidance and support to navigate challenges and opportunities. Additionally, several private initiatives have established business incubators and accelerators focused on supporting MSMEs in high-growth sectors like technology and social entrepreneurship. These programs offer resources, networking opportunities, and mentorship to help young businesses thrive.

Real-life examples like the Lebanese League for Women in Business (LLWB), which offered mentorship programs and networking opportunities to support women-led MSMEs during challenging times, and Berytech Ventures, a leading venture capital firm in Lebanon that focuses on supporting and investing in innovative startups and MSMEs, showcase the tangible impact of these collaborative efforts.

While the challenges facing Lebanese MSMEs remain significant, these combined efforts by the ministries, international organizations, and the private sector demonstrate a commitment to supporting their survival and growth. By fostering an environment that encourages innovation, facilitates access to resources, and promotes collaboration, these stakeholders can play a vital role in helping Lebanese MSMEs navigate the crisis and build a more resilient and diversified economy for the future.

Information and Communications Technology (ICT) and e-commerce have grown faster in Lebanon as a result of the crisis and government actions. Leveraging the increasing demand for digital enterprises, e-commerce, and the green economy not only helps businesses and employees through this transitional phase, but also paves the way for improved employment opportunities in the future. To enhance employment in terms of number and quality, it is imperative to concentrate on developing industries and business prospects, and to establish a connection between skill enhancement and investment.[49]

49
Synthesis of the crisis impact on the Lebanese labour market and potential business, employment and training opportunities. (2022, June 14). Www.ilo.org. https://www.ilo.org/beirut/publications/WCMS_848390/lang--en/index.htm

One of the biggest operational costs for MSMEs in Lebanon is energy, and this comes with an inability to access reliable energy sources and the need to resort to high-cost alternatives such as private energy providers (using generators) or investing in capital-intensive, privately-owned solar energy systems.[50] MSMEs continue to play an important role in the country's energy transition and the current situation can be an opportunity for an enhanced role for MSMEs to ensure a sustainable and equitable transition.

II The Energy Sector and Climate Change

Lebanon's power sector is the 'biggest drag on its economy and environment,' according to the latest World Bank Climate Change and Development (CCDR) report.[51] In fact, the country is among the least prepared to face climate change impacts, due to its limited adaptive capacity. In 2022, Lebanon ranked 161 out of 192 countries in terms of readiness to face climate change.[52] Struggling through decades of mismanagement and shortage of investments, lack of proper grid maintenance and reliance on imported expensive and polluting sources of energy,[53] the electricity sector was among the first to reflect the depth of the crisis.

The economic collapse has exacerbated electricity sector challenges, reducing infrastructure maintenance, electricity generation, and increasing the risk of power system collapse. Currency devaluation and a shortage of hard currency have led to rationing of fuel imports for electricity generation,[54] and consequently to a significant decrease in the hours of supply from around 12 hours/day in 2019 to around 1-3 hours/day in 2021. This was a direct repercussion of the inability of the government to continue buying fuel and subsidizing EDL's power generation. Furthermore, the explosion at the Beirut port destroyed major assets, including EDL's headquarters (situated only a few hundred meters away from the port) and, more critically, EDL's national control center[55].

In July of 2021, Lebanon signed a deal with Iraq that stipulates the exchange of Iraqi fuel with 'goods and services' that the Iraqi ministries can use, such as medical services. Given that the Iraq-sourced fuel does not meet local requirements, Lebanon swaps the imported fuel with other types of oil (gas oil and low-sulfur fuel oil) to run only two of the existing power generation units, and has been relying

50 Maalouf et. al. (2023), Business Survival Strategies in a Polycrisis: SME Experiences from Beirut, Lebanon. Preprint for Business Horizons special issue.

51 World Bank (2024). Lebanon Country Climate and Development Report. Open Knowledge Repository (worldbank.org).

52 These data are from the Notre Dame Global Adaptation Initiative Country Index (database), Notre Dame, IN (accessed in November 2023). https://gain-new.crc.nd.edu/country/lebanon.

53 Ahmad, A., McCulloch, N., Al-Masri, M., & Ayoub, M. (2020). https://ace.soas.ac.uk/publication/from-dysfunctional-to-functional-corruption-lebanon-electricity

54 Ayoub, Marc, Rizkallah, Pamela, Abi Haidar, Christina. 2021. 'Unbundling Lebanon's Electricity Sector'. Issam Fares Institute for Public Policy and International Affairs.

55 Ahmad, A., Al-Masri, M., McCulloch, N., & Ayoub, M. (2020). Beirut Blast: Restoring Power is Important but so is restoring trust. https://ace.soas.ac.uk/beirut-blast/

on this unique source since then. Critics have questioned the agreement's transparency, its impact on energy security, as well as the pressure on an already suffering economy[56] that is unable to pay the Iraqi government, something that is regularly causing delays in delivery of supplies.[57]

For households and MSMEs that were able to afford the cost of subscribing to the neighborhood's private generator *(ishtirak)*, or run their own, they had to live through 8 to 10 hours of complete blackouts. For those that are unable to endure such costs, blackouts stretched over 21-23 hours/day. In 2022, and following the issuance of the National Electricity Emergency plan, electricity subsidies were completely removed and electricity tariffs were raised, lifting hopes of increased power supply.[58]

The almost complete collapse of the national utility Electricité Du Liban (EDL) and the increasing fuel prices have pushed many households and enterprises to resort to the installation of renewable energy technologies (mainly solar power) to generate electricity that satisfies their consumption needs. The private sector invested more than USD 500 million in decentralized solar applications during the crisis by 2022,[59] an amount that is expected to be much higher by now.

The Distributed Renewable Energy Law No.318/2023 was passed on December 14, 2023 by the Lebanese Parliament. The law allows for the involvement of the private sector in the production and sale of renewable energy. Challenges facing the law's implementation are still in place, and include the appointment of the Electricity Regulatory Authority (ERA), an improved billing system, and access to financing opportunities.[60]

On a national level, the excessive use of distributed diesel generators and the continuation of the burning of fuel oil in EDL's power plants meant that harmful emissions were on the rise. With an estimated 8,000 running diesel-based power generation units to partially fill in the power deficit, Lebanese cities are experiencing a drastic deterioration in air quality and overall health. One stark indicator is the doubling of the risk of developing cancer.[61]

Beyond health and air quality impacts, the rising levels of air pollution and the significant increase in greenhouse gas emissions translate directly to a worsened economic impact. The Climate Change and Development Report (CCDR) states that Lebanon would face up to a 50% decrease in water availability in the dry season and between

56
Atallah, N. (2024). Lebanon Plans to Rely on Iraqi Fuel Despite Unpaid Bills and Cheaper Alternatives. https://www.thenationalnews.com/news/mena/2024/06/19/lebanon-plans-to-rely-on-iraqi-fuel-despite-unpaid-bills-and-cheaper-alternatives/

57
Orient Today (2024). Iraq approved fuel supply for Lebanon. Iraq approved fuel supply for Lebanon - L'Orient Today (lorientlejour.com)

58
Lebanon raises electricity tariff, lifting hopes of increased power supply (thenationalnews.com).

59
Boukather, Carol Ayat. 2023. 'Re-energize Lebanon: 5 Action Steps to Rebuilding Lebanon's Collapsed Electricity Sector.' Issam Fares Institute for Public Policy and International Affairs.

60
Taha, Ali, Akel, Rasha (2024). Regulating the Energy Transition: Lebanon's New Law on Distributed Renewable Energy. The Lebanese Center for Policy Studies.

61
Cheeseman, A. (2024). 'Where can you hide from pollution?': Cancer Rises 30% in Beirut as Diesel Generators Poison City. https://www.theguardian.com/global-development/2024/apr/22/where-can-you-hide-from-pollution-cancer-rises-30-in-beirut-as-diesel-generators-poison-city

1.1%-2% further yearly declines in Lebanon's GDP by 2040 due to climate change impacts.

These facts expose the drastic multiplier factor between climate change, the worsening economic conditions, and the energy system. Investing in climate change adaptation and mitigation can now only be seen as integral for economic investment and future growth. The private sector, led by MSMEs, would also need to realize their role as forerunners in climate smart investments, both for their own business and to develop the skills needed to play an active role in implementing adaptation and mitigation solutions in the country.

III MSMEs in Lebanon's RE Sector: Challenges and Opportunities

The renewable energy (RE) sector in Lebanon has witnessed remarkable growth following the country's crisis, offering MSMEs a mix of challenges and opportunities. Lebanon's energy crisis has inadvertently spurred a notable surge in solar power adoption, with registered businesses increasing from approximately 150 in 2020 to over 800 today.[62] This surge, driven by the unreliable national grid, abundant sunshine, and decreasing solar panel costs, presents significant opportunities for MSMEs.

MSMEs play a pivotal role in shaping Lebanon's solar landscape. Engaged across the solar value chain, they undertake tasks ranging from design and installation to commissioning and maintenance, catering to various sectors including residential, industrial, commercial, and public. Furthermore, they contribute to sectoral growth by executing turnkey projects, driving an anticipated compounded annual growth rate of 10% from 2022 to 2030.[63] Employment opportunities within these businesses have surged by 70% from 2020 to 2022.[64]

However, this rapid expansion also brings forth challenges. MSMEs grapple with operational instability, electricity supply issues, security concerns, and administrative hurdles, hindering their smooth functioning. Financial constraints, including high startup costs, regulatory complexities, and infrastructure limitations, further impede their growth trajectory. In addition, the urgent need for enhanced trainings and vocational programs for technicians in the solar and renewable energy sector was reported to be critical for sustainable growth by one market assessment study.[65] RE firms believe that it

62 Renewable Energy Outlook Based on Renewables Readiness Assessment and REmap Analysis Lebanon about IRENA (2020) https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Jun/IRENA_Outlook_Lebanon_2020.pdf

63 IRENA (2020), Renewable Energy Outlook Based on Renewables Readiness Assessment and REmap Analysis Lebanon about IRENA. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Jun/IRENA_Outlook_Lebanon_2020.pdf

64 *USAID/Community Support Program (CSP) in Lebanon Market Assessment Solar Energy Sector in Lebanon.* (2022). https://csplebanon.org/wp-content/uploads/2022/08/Lebanon_CSP_Market_Assessment_Solar_Energy_Sector_APR_2022.pdf

65 *USAID/Community Support Program (CSP) in Lebanon Market Assessment Solar Energy Sector in Lebanon.* (2022). https://csplebanon.org/wp-content/uploads/2022/08/Lebanon_CSP_Market_Assessment_Solar_Energy_Sector_APR_2022.pdf

would be essential to strengthen vocational education in the areas of technical and secondary schools. Still, not many programs are in place to provide students with the necessary training for solar projects.[66]

Despite these obstacles, RE MSMEs contribute positively to Lebanon's energy transition by promoting solar solutions, reducing dependence on costly and unreliable fossil fuels, and driving economic recovery through job creation and economic stimulation. To fully capitalize on the sector's potential, addressing quality concerns and fostering responsible growth through partnerships and support mechanisms are imperative. This will pave the way for a sustainable energy future and ensure MSMEs play a significant role in Lebanon's renewable energy landscape.

66 The curricula must include topics like installation, safety precautions, wiring, upkeep, troubleshooting, etc. The only curriculum at Lebanese technical vocational schools that is currently directly relevant to the solar energy industry is the LT Renewable Energy. Only two to three chapters or courses on solar energy are included in other curricula such as BT or TS industrial, mechanical, and electro technical.

IV Methodology

This section of the report describes the methodological framework developed to provide deeper, data-driven insights on the role of MSMEs in the clean energy transition in MENA. To do that, this study relies on primary and secondary data and uses mixed methods to generate different types of data that can bring us closer to answering the research questions. It relies on using a nation-wide, firm-level survey, five focus group discussions, 24 key informant interviews, and secondary sources involving official government publications and scientific literature belonging to the most recent research conducted by leading research institutions locally, regionally, and internationally.

In addition to the information mentioned above, the research follows three levels of analysis and associates several relevant variables to each for later measuring. At the micro level, the study looks into a number of variables that measure employment and gender/age balance, socio-economic indicators, and data on energy consumption in MSMEs. The meso level data collection and analysis capture the different models of power generation and distribution being adopted, the state of the infrastructure, as well as climate adaptation, and explores potential synergies in urban, rural and industrial settings. All of that data will feed into the study's public policy dimension, in which an examination of relevant macro-economic indicators, taxation systems, current government strategies, policies, and available financing schemes benefitting MSMEs will build on the first two levels to eventually inspire policy-oriented recommendations.

Yet, it is important to highlight several constraints that the research team has to face at the time of writing, in particular the impact of the ongoing war on Gaza that started in October 2023, with its repercussions on Southern Lebanon, resulting in displacing approximately 100,000 people and causing thousands of businesses to halt in the south. Although not solely mentioned in the study, the overall situation has impacted both the qualitative and quantitative data collection, especially the ability to hold FGDs and personal interviews in impacted areas. In addition, the negative impact of the economic collapse on the overall business environment and risks across the country, as well as businesses' and investors' appetite to enter in discussions on such issues in times of war, should be noted and considered in future research.

Below, we present an account of the methods used in data collection.

Quantitative Methods

A Nation-wide, Firm-level Survey

The preliminary literature review has shown a lack of comprehensive or recent quantitative data on MSMEs in most of the six MtyuioENA countries, particularly in Lebanon, where the existing information about these entities is sparse. A firm-level survey covering 800 MSMEs was incorporated into the research design to generate a wide range of quantitative data relating to the energy consumption of MSMEs, their economic activities and performance, as well as the workforce they employ across the six countries.

By harmonizing the survey instrument and the sample design across the six case studies, such data can enable some comparative insights. This however has been hard to achieve, given the varying land and population sizes, social and political structures, geography, energy situations, cultures, and macroeconomic models between these countries. Even language could not be taken as a universality, given the stark dialectic heterogeneity among some of them. Attempting to harmonize data across the six case studies therefore shaped to a large degree the design of this survey and the methods employed to implement it.

Survey Design

Target Population

The target population of the survey was businesses with less than 100 employees that started their operations before 2023. Businesses that started their operations during 2023 were not eligible for the survey.

Sample size

A fair budgetary allocation of resources meant that the implementation of the survey had to cost around the same in all six countries, which introduced constraints to the sample size and the collection mode. A sample of 804 MSMEs was selected as the optimal size that can both attain representativeness, all while being financially feasible.

Data Collection Mode

Deciding on which data collection mode to use was also subject to several budgetary, logistical, and time limitations due in part to the instability of certain regions covered by the study. Using Computer-Assisted Personal Interviewing (CAPI) was an impractical option to collect data due to logistical concerns and the required large distances of travel. To avoid undesirable mode effects between the case studies, Computer-Assisted Telephone Interviewing (CATI) was the only feasible mode of collection despite not being an ideal or practical one for some of the countries.

For Lebanon, due to our inability to reach the target sample size through CATI, after having exhausted all the phone numbers in the data set constituting the frame, a mixed mode approach was pursued thereafter. Eventually, 105 interviews (13% of the total number of interviews) were completed through CAPI.

Survey Instrument

A modular questionnaire involving a range of thematic areas was adopted, as it enables more effective and efficient harmonization and data aggregation, all while capturing the nuances and idiosyncrasies of each of the six countries. The Lebanon questionnaire, for example, had 10 modules, while for Egypt, it incorporated only 5. These modules, particularly the ones about electricity consumption underwent topical and terminological adaptation to national contexts.

Frame Selection and Non-probability Quota Sampling

The choice of the collection mode determines the frame to use for sample selection. Ideally, a probability sample should cover all target population units, i.e., a list of all working businesses of size 100 employees or less that started operations before 2023, or a representative one, or at least one where relevant biases are known. Unfortunately, we could not find such a list in Lebanon. In the absence of such a frame, all

that the research team had access to is a dataset of more than five million mobile and landline telephone numbers. Little was known to us on the compilation process and the potential biases therein, which diminishes the feasibility of probability sampling (i.e., of achieving a randomized sample).

A smaller frame was constructed, one that first eliminates expired or inactive SIM cards, and those owned by non-Lebanese. To achieve this, the selection relied on phone numbers of respondents in recent studies conducted by the contracted polling company (2018–2022, excluding 2020, due to the pandemic). An exhaustive sample of these respondents amounts to 32,000 individuals, among whom 6,979 were entrepreneurs/business owners.

Quota sampling was implemented to match with regional and sectoral distributions based on a 2001-2004 Economic Research Forum (ERF) study by Kamal Hamdan.[67] Despite the availability of more recent studies, such as the 2014 Inventis study,[68] they lacked a regional distribution of MSMEs, and not much was known about the employed methods. For that reason the distributions as shown in the referenced study were used, all while acknowledging the changes that must have occurred at the macroeconomic level since that survey was conducted.

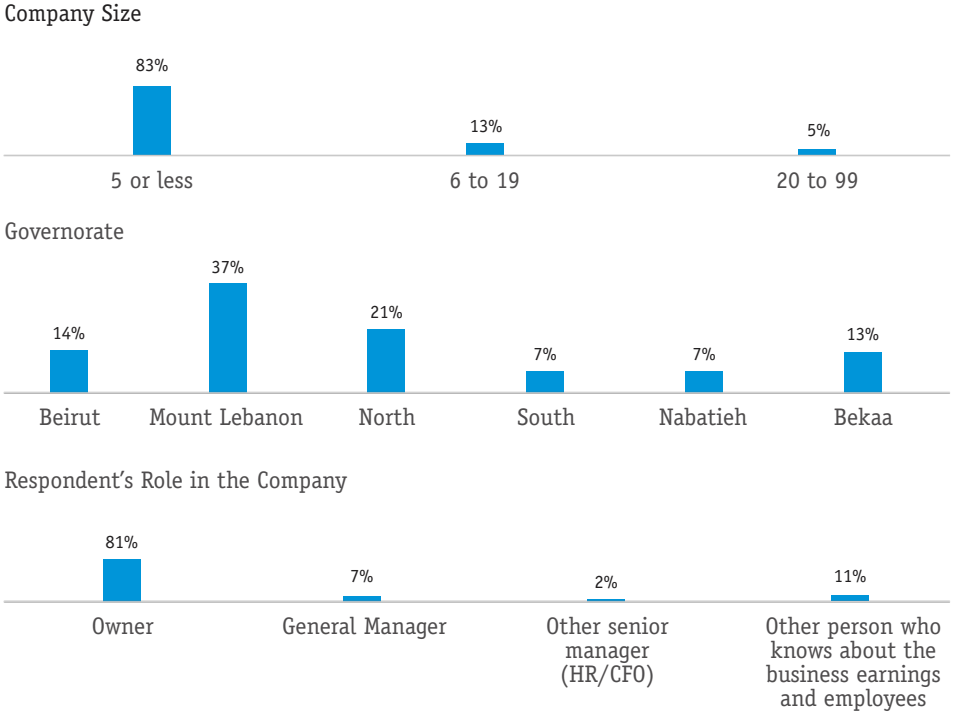
This sample is therefore not representative of the population of MSMEs across Lebanon. However, given that such changes were not drastic across sectors between the two studies, and the fact that the type of work an enterprise does (sector) is a key determining factor of their electricity consumption, the observations achieved through the survey instrument can be indicative of trends happening in the population itself, i.e., of MSMEs in Lebanon.

The total number of contacts loaded on the system is 6,979, while the total number of contacts used is 6,450. Up to three calls were attempted to contact phone numbers that did not answer or were busy lines. In total, 10,798 call attempts were made, out of which 699 successful CATI interviews were conducted. To meet the target sample size and the quota requirements by region and sector, 105 interviews were conducted through CAPI.

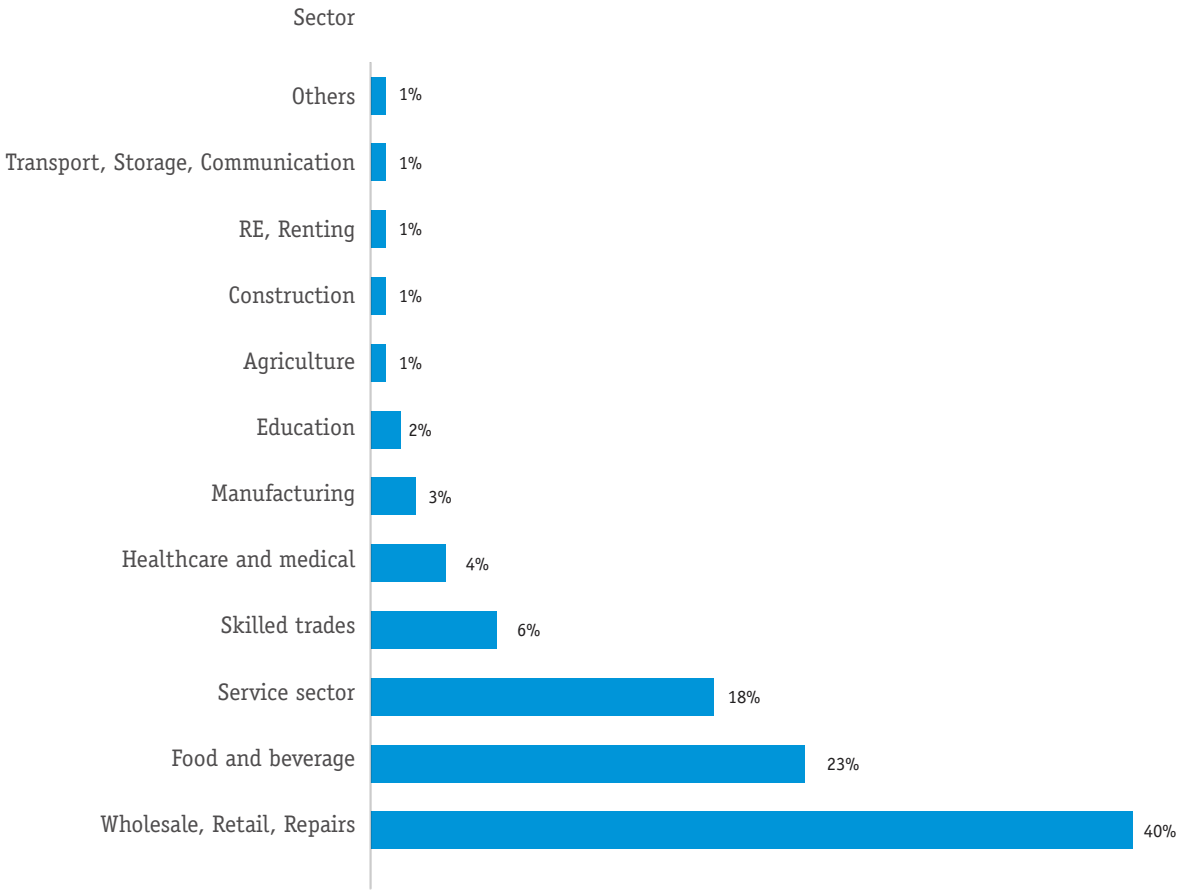
67
Kamal Hamdan. 2004. Micro and Small Enterprises in Lebanon. Economic Research Forum. https://erf.org.eg/publications/micro-and-small-enterprises-in-lebanon/

68
Ministry of Economy and Trade. 2014. Lebanon SME Strategy: A Roadmap to 2020. https://www.economy.gov.lb/media/10312/lebanon-sme-strategy-english-web.pdf

Graph 1 **Sample Structure**



Graph 2 **Sample Structure**



Qualitative Methods

The primary qualitative data collection part of this research included five focus group discussions (FGDs) distributed over three themes. Distributed renewable energy systems, a model of decentralized power supply that has been implemented in many regions in Lebanon, is among the project's main areas of investigation. To get a deeper insight into the feasibility, management, and reliability of such a model at the municipal level and the role of municipalities in the process, three FGDs were conducted in Balloul, Kfarmishki, and Bichmizin as case studies of community projects that implemented hybrid solutions with renewable energy and diesel generator-based systems. The focus group discussions brought together a representative of the municipal council, a municipal energy technician, other local electricity providers, and owners of MSMEs in those areas.

The remaining two focus group discussions were supposed to cover the renewable energy and energy efficiency sectors, as well as the competitiveness of MSMEs using renewable energy (RE) and energy efficiency technologies. Yet, due to the security concerns and unstable situation since the October 7 events in Southern Lebanon, these were replaced with 6-8 key informant interviews from each topic, which included representatives of importers, distributors, operation and maintenance, and MSMEs.

During the data collection phase, additional insight was gathered that steered the research team to complement the above with:

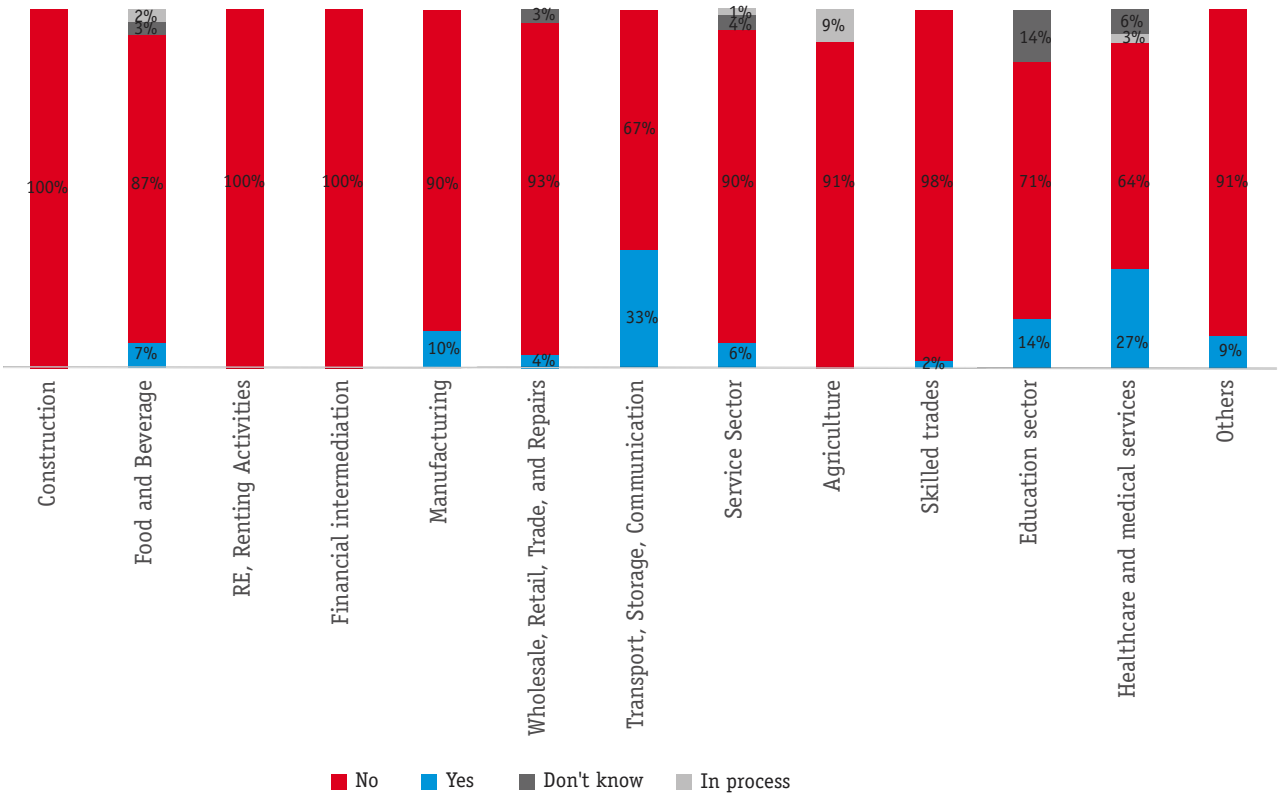
- 24 key informant interviews with industry experts, banking sector experts, public servants within different ministries and institutions, MSME owners/representatives, international organizations, as well as specialists in the field of energy transition. The list of interviewed key informants is mentioned in Annex 1.
- A Focus Group Discussion (FGD) outside of the energy sector, particularly focused on the agri-food sector.

V Findings

Survey Findings

The findings from the quantitative survey on MSMEs in Lebanon and their role in the energy transition revealed several key points. Firstly, it was noted that 32% of the participating enterprises had female managers or owners, with medium enterprises holding the biggest share. On average, medium enterprises had both the most female full-time workers, as well as the highest number of young professionals (aged between 18 and 24).

Graph 3 **International Certification by Sector**



Only 7% of the enterprises had globally-recognized certifications, with a third of these being ISO certified.

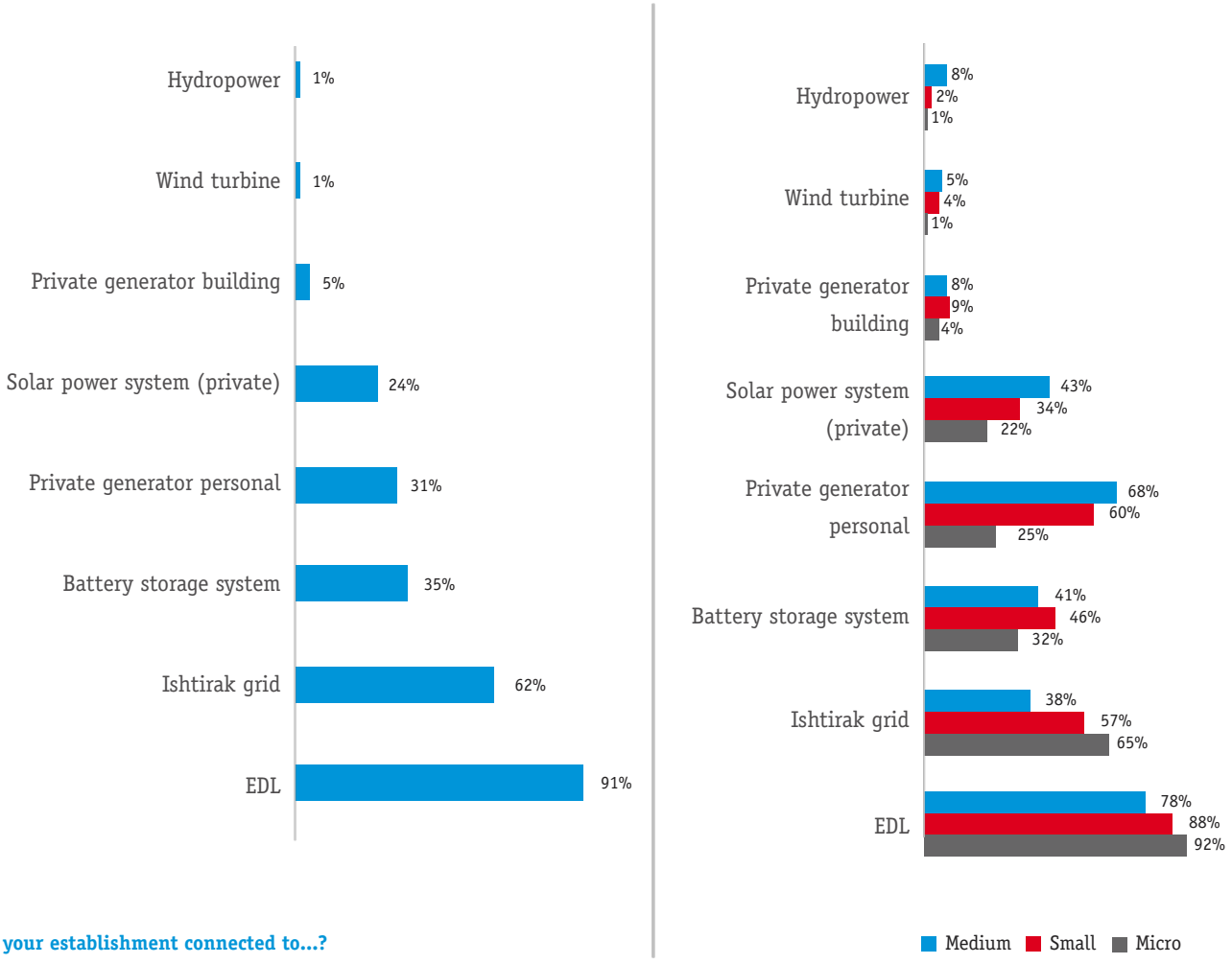
In terms of staff and size, micro-enterprises typically had an average of 3 employees, small businesses had 9 employees, and medium businesses had 43 employees.

The composition of these employees varied, with micro-businesses having one woman and one young worker on average, small businesses having 3 women and two young workers, and medium-sized enterprises having 13 women and 9 young workers.

Financial support through loans or grants was limited, as only 2% of enterprises had received assistance in the past five years, with half being acquired in 2023. However, 67% of those who had not received funding expressed interest in applying for it, if available. Additionally, 15% of all respondents were aware of current grant opportunities.

Electricity needs varied among businesses, with 24% requiring a minimum of 8 hours of power daily, while 18% needed a 24-hour supply, primarily from the food and beverage and healthcare and medical services sectors. The peak consumption for over 70% of enterprises typically occurred between 10 am and 2 pm.

Graph 4 **Energy Access by Enterprise Size**

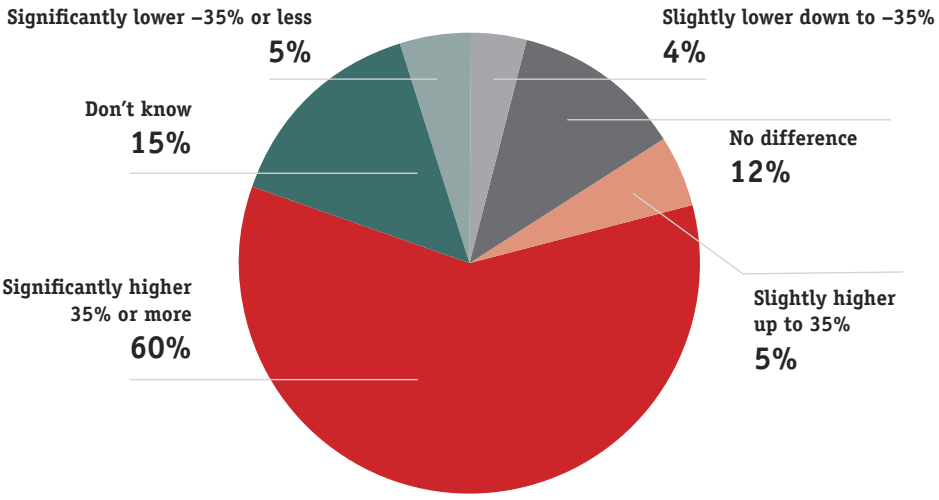


Q **Is your establishment connected to...?**

As visualized in graph 4, the majority of enterprises (91%) were connected to EDL, with 62% also connected to ishtirak (private generator subscription). Additionally, 36% had generators, 35% had battery storage systems, and 24% had solar energy systems. Generator capacities and average amperage for different business sizes were also highlighted, showing the varying needs of businesses in terms of electricity supply.

During the 2022 energy crisis, 40% of enterprises reported no interruption, while 34% experienced reduced operating capacity, and 15% ceased operations. In times of prolonged blackouts, 44% did not seek external assistance, while a third contacted utility providers. Stabilizers or inverters were used by 69% of enterprises to manage electricity fluctuations.

Graph 5 **Response to 2022 tariff adjustment**



Q **How does it compare to the last bill before the tariff adjustment?**

The study revealed that the average amount of the last EDL electricity bill was LBP 5.7 million. When broken down by business size, micro enterprises were found to have an average bill of LBP 4 million, small enterprises LBP 13.5 million, and medium enterprises LBP 27.5 million. It was notable that 60% of the surveyed enterprises indicated that their last bill was significantly higher following the tariff adjustment, as shown in graph 5.

Furthermore, the study also explored generator expenses among businesses, revealing that the monthly average expenditure was USD 844. The costs varied based on the size of the enterprises, with micro businesses spending around USD 335, small businesses approximately USD 1.7 thousand, and medium enterprises about USD 2.2 thousand per month.

It was reported that 70% of businesses connected to solar power reported being very satisfied with the system, with 29% being satisfied and only 2% unsatisfied. Additionally, 39% of respondents expressed a lack of interest in expanding their current energy systems, attributing it to their existing setup-to-space constraints or the high cost involved.

Moreover, findings suggested that over half of the surveyed businesses were open to adopting alternative renewable energy solutions, primarily to reduce expenses and ensure uninterrupted electricity supply.

Addressing challenges faced by enterprises, it was observed that 22% were affected by the loss of skilled human capital, 74% by the banking crisis, 66% by civil unrest, and 40% by adverse weather or natural events.

VI Focus Groups

Municipal Level RE Projects and Implications for MSMEs

In the absence of a properly functioning national utility to provide reliable and accessible electricity for residents and businesses, several municipalities across Lebanon stepped in to fill this gap by installing distributed renewable energy (mainly solar power) systems in their jurisdictions and coupled these systems with already existing diesel generator networks, forming hybrid mini-grids. As such, several municipalities have emerged as key players in Lebanon's energy transition and have partially enhanced the quality of life of their residents. Focus group discussions brought together members of the municipal councils, technicians, MSME owners, and residents from a selection of localities that have implemented some form of a hybrid mini-grid model.

All focus group discussions emphasized the essential role played by the municipalities in enabling the successful implementation of these solar power installations. Municipalities play an important role in the

management and oversight of the project's implementation and serve as an intermediary between residents on the one hand and a diverse group of stakeholders on the other. The latter involves central public administrations, local private businesses, expat communities, civil society organizations, and international funding agencies. Furthermore, multiple focus group discussions mentioned that the municipality manages the project in a non-profit manner.

The technical evaluation of the hybrid mini-grid's successes and challenges differs per case. In Baaloul, for example, the municipality used the electricity network that had previously been extended to the generator network, thus saving large sums of money that would have been needed to install a new network. The municipality also repurposed an existing energy system used for water pumping that was not operating for the new hybrid mini-grid.

These projects contributed to reducing the costs of using generators for subscribers, enhancing the availability of electricity, reducing air and noise pollution from diesel generators, and increasing environmental awareness. The lack of additional financing was noted as a main obstacle to the expansion and maintenance of these infrastructure projects. Focus group participants from the municipality of Bechmizine, for instance, mentioned that due to the lack of funding and the decrease in municipal revenues, an increased reliance was placed on assistance and donations from donors and expats. In the municipality of Baaloul, it was reported that the hybrid mini-grid system meets the electricity needs of residents at a lower cost and in a constant (reliable) manner. It was also noted that local households and businesses connected to this system have seen their diesel generator bills shrink by approximately 18%.

In the municipality of Kfarmishki, and prior to the adoption of the hybrid model, businesses suffered a rise in production costs due to power network outages and high energy costs. Some businesses relocated in search of a more affordable and reliable supply of electricity. Shop owners stopped offering products that require constant refrigeration (such as dairy, ice cream, butter, and other items) due to similar issues. The municipal mini-grid provided electricity to households and institutions 24 hours a day through solar and diesel generators, resulting in 80 percent cost savings compared to using private generators alone. This allowed local businesses to restart operations, hire more staff, and expand offerings like refrigerated products. MSMEs noted that relying on the municipality for their electricity

needs is much more feasible than installing their own private renewable energy systems, which have a high capital cost and require continuous maintenance.

Regarding job opportunities generated by this hybrid model on the community level, focus group participants for the municipalities of Baaloul and Kfarmishki reported that the current arrangement of the project does not generate new jobs for residents, at least not in any significant manner. It was noted that a larger-scale initiative, one involving a consortium of several towns or at the district level, would be better suited to generate new job opportunities that cater to individuals with specialized and non-specialized skills (experts in electricity maintenance and specialists in alternative energy, as well as staff to address residents' concerns and complaints). In the case of Bechmizin, schools witnessed a 10% annual growth in student enrollment due to reduced energy costs. The growth of the education sector involved the creation of 140 positions consisting of teachers, administrators, and employees in the maintenance and cleaning departments. It was noted that the new hybrid system has helped in boosting the local economy in addition to enhancing the quality of life for residents.

In summary, on the community level, initiatives by municipalities to set up localized hybrid mini-grids combining solar with diesel generators or the national grid provided a boost to local economic activities previously constrained by crippling power deficits. Models like those implemented in Kfarmishki, Bichmizin, and Baaloul revived businesses by providing reliable and affordable electricity supply. While these mini-grid projects were unable to create many direct employment opportunities, they showed potential for generating jobs like technicians, customer service, and administrative roles if scaled up, including opportunities for women and youth. Municipal leadership, strategic planning, and collaboration with expatriate communities, private sector, and international organizations were highlighted as critical enabling factors for such projects.

Renewable Energy (RE) and Energy Efficiency (EE) for MSMEs

MSME representatives in the focus groups on the RE and EE sectors and sustainable technology adoption highlighted that the demand for solar energy has recently been witnessing a shift from the residential to the industrial, commercial, and healthcare sectors. The renewable

energy and energy efficiency sectors face several challenges for their growth. These challenges have financial, regulatory, and social aspects. The financial challenges are mainly linked to the absence of government assistance in the form of subsidized loans which renders RE and EE technologies unaffordable to many enterprises under the current socio-economic environment. As for the regulatory challenges, the lack of enforcement of quality control standards results in the entry of recycled equipment, which poses safety risks and undermines consumer confidence. The failure to enforce existing regulations places RE and EE businesses with higher qualifications and levels of experience in an uneven competition with firms that opened shop during the recent crisis. Also, it was reported that instability and uncertainty are generated by frequent changes in customs and taxes.

MSMEs Using Renewable Energy Technologies

Participating MSMEs installed solar energy systems to reduce their reliance on EDL and diesel generators, and to decrease their energy expenditures. Installed between 2020 and 2023, these renewable energy systems helped ensure the continuity of these enterprises' daily activities. It was reported that these systems varied in size according to their needs, with systems ranging in size from a few kW up to 50 kW. The electricity daytime needs of most of the surveyed enterprises were met by the installed renewable energy systems. Participants praised these individual RE systems for providing a stable power source, having minimal malfunctions and environmental benefits, as compared to fossil fuel alternatives (generators). Although some enterprises require generators at night as additional sources, all respondents acknowledge the cost-effectiveness and improved production stability. Some MSMEs experienced a near-complete nullification of their electricity bills. The financial gains ranged from $750 to $2,500 per month, with up to a 40% reduction in operation costs. These findings demonstrate the economic viability of renewable energy for enterprises, which has proven to be both cost-effective and sustainable.

However, financing constitutes the main challenge that most enterprises face when implementing renewable energy systems. This is partly due to the high capital expenditure needed and the lack of access to bank loans or governmental support. Many enterprise owners were forced to rely on personal resources or limited funding to finance these projects which led to the installation of suboptimal systems in some cases.

Participants also acknowledged behavioral changes related to power outages and electrical equipment malfunctioning—an overall reduction in anxiety came with the installation of these solar energy systems. Benefits accrued from the increased availability of electricity provided by the solar energy systems included an increase in production capacity, improved product quality, and reduced spoilage. Nonetheless, MSMEs facing higher initial installation costs or those that were unable to access finance to install a renewable energy system optimally-sized for their needs have experienced a delay in their ability to compete effectively. Enterprises emphasized an increased need for additional policies that support local businesses (through tax exemptions, for example), foster fair competition, and encourage the adoption of sustainable technologies.

Energy Efficiency and MSMEs

Despite the existence of architectural standards for energy efficiency in Lebanon, these standards are not widely implemented and are only applied in a select few of modern buildings. The lack of enforcement of these standards, the prevalence of individual initiatives leading to inconsistent applications, the limited awareness and understanding of energy efficiency standards, and the cost considerations associated with implementing these standards result in a suboptimal energy performance for the built environment and a weak application of energy efficiency norms.

Some commonly adopted standards and technologies for the built environment include double walls and insulated glass, which enable better thermal insulation, high ceilings to facilitate natural ventilation, dedicated spaces for installing solar panels to maximize energy capture, foundations capable of bearing additional weight for installing solar panels, natural lighting systems which reduce lighting energy expenditure, and covered electrical extensions to prevent energy loss.

Respondents reported that the average reduction in total energy costs by applying energy efficiency measures ranges from 15% to 40% depending on several factors such as building standards, geographical location, and energy equipment (appliances with energy-saving features, such as inverters). Although none of the surveyed enterprises currently meet energy efficiency standards, many expressed a desire to transition to energy-efficient technologies once financial conditions allow for it. Some enterprises have implemented small improvements such as the

installation of LED lights and inverter motors; however, a complete overhaul of their current infrastructure was deemed to be too expensive and not viable.

Respondents called for a stronger enforcement of existing standards, increasing awareness through educational programs, providing financial incentives for adopting energy efficiency measures as well as accessible, low-interest loans, offering customs and tax exemptions for efficient equipment and for renewable energy systems, increasing government support for small enterprises in particular, and improving security measures to ensure safe and sustainable applications.

Thrivers: The Case of the Agro-Food Sector

For some sectors, the crisis 'closed one door and opened another.' A focus group with MSMEs (including one start-up) that operate in the agro-food sector yielded insight on how some enterprises were able to build on opportunities and perform better than others due to both (1) external socio-economic parameters and (2) internal business concepts and strategies.

The economic downturn did result in hyperinflation, nevertheless several MSMEs experienced a decrease in their production and operating costs. This, coupled with a significant decrease (in dollar terms) in employee salaries and the relative sudden increase in the price of imported goods (in LBP terms) created a positive economic environment for some MSMEs. Respondents from the agro-food sector reported that they experienced an increase in market demand during the period right after the beginning of the crisis and were able to continue operations and even grow.

Despite the significant decrease in access to finance options compared to pre-crisis levels, market conditions proved supportive for sectors like the agro-food—at least in the initial period of the crisis—primarily due the large drop in operating costs linked to sourcing energy, employee salary, and an increased price (in LBP terms) for imported goods, rendering locally produced goods and products more attractive for locals facing a loss of purchasing power. Respondents highlighted the sector's strong potential despite current bureaucratic challenges and public sector inefficiencies, describing the industry as 'being in its golden age.'

In addition to the external economic factors, respondents reported that a mindset of resilience, adaptation, and perseverance was

paramount to maintaining business operations and for capitalizing on opportunities made available by the crisis. One respondent said, 'We must be able to offer a product that meets market needs, solves problems, and adds value to others.' Furthermore, diversification (and the production of new goods/products) and context-relevant expansion planning were also referenced.

As for exporting goods and accessing new markets, respondents praised training provided by associations and development organizations on export readiness, in addition to technical assistance. As one respondent put it, 'With the Ukraine crisis, the company began noticing the effects of the COVID-19 pandemic and the Ukraine crisis on its export potential…consequently, the idea of food security emerged.' Export potential for the agro-food sector grew due to the increased competitiveness of local products, nonetheless, two main hindrances were reported: (1) having enough scale and size to be able to export (a respondent reported that they partner with other small companies to export their products in one container), and (2) lack of enough knowledge about international standards such as ISO and quality certifications. They called for more collaboration to streamline administrative processes, partnerships, and networking to overcome operational bottlenecks, highlighting the role the regional Chambers of Commerce should play in this regard.

With market dynamics transitioning slowly to a state of partial adjustment, energy subsidies were decreased, the electricity tariff was adjusted to reflect the cost of production, and salaries showed an adjustment to the 'dollarization' of the local economy. The opportunities that were capitalized on by some MSMEs during the initial period of the crisis were short-lived. Respondents noted that after the subsidy removal, the cost of energy sourcing rose dramatically, ranging between 10% and 40% of their total production costs. Nonetheless, agro-food MSMEs were still able to perform better than other sectors. In fact, this was linked to the low purchasing power and the relatively high prices of imported goods and the increased import tariffs on products relevant to food security (which was also part of the partial market adjustment).

Respondents reported several adaptation strategies that kept them afloat, namely, investing in renewable energy systems as a necessary measure to decrease energy expenditure, using technology such as energy monitoring applications and water conservation measures to

reduce production costs and 'accommodate the production to the availability of energy.' Nonetheless, some did report a decline in production and sales, and others doubted the potential of renewable energy, preferring to reduce production rather than paying the additional costs.

When probed about additional measures that could be implemented to enhance business performance, MSMEs highlighted the importance of training on technical know-how and assistance by associations and development organizations (financial, technical, energy efficiency, and other), which declined somewhat due to an increase in competition in the sector. As one respondent explained, 'Some regions classified as more impoverished receive greater support for projects.' Furthermore, increased networking and cooperation between MSMEs and farmers in particular was proposed to enhance the business environment: 'We can achieve these effective partnerships that enhance cooperation with farmers by providing opportunities for exchanging expertise and necessary financial support.' Respondents also highly recommended increasing customs duties on imported goods so that their product can compete and enter the Lebanese market.

When asked about needs from the government and future outlook, some companies said that access to adequate financing and a more efficient banking sector are crucial for their businesses to flourish. The current growth, according to some, has been driven by personal will to invest from personal or family savings, along with crucial contributions, support, and grants from organizations like Berytech, the European Bank, Food and Agriculture Organization (FAO), and USAID, among others. Yet, this remains inadequate and hinders further business scale-up. The need for adequate financing options can also be linked to respondents' statements on the need for a transition to increased automation in their production lines and increased investment in energy-efficient solutions (particularly for heating and cooling purposes).

Key Informant Interviews (KIIs)

The onset of the economic and financial crisis created immense new challenges for MSMEs in the energy sector. Their ability to access financing for investments like renewable energy or efficiency projects was crippled, with the national ratio of private credit to GDP plummeting from 110 percent pre-crisis to just 6 percent currently.[69]

69 Interview with an energy finance expert (Interviewee 2, 2024).

This lack of access to capital became the biggest barrier to growth, as well as job preservation and creation for MSME's.[70] As businesses grappled with skyrocketing energy costs, an unregulated boom of around 1000 MW of distributed solar installations were completed in just 3 years, as firms scrambled for solutions—the 'solar boom' was described as market driven.[71] However, this rooftop solar proliferation was plagued by issues like lack of financing options, space constraints, shortage of skilled personnel, and substandard equipment installed by unqualified companies.[72] Moreover, there was no comprehensive mechanism in place at the level of the government that allowed to bring all relevant departments together.[73]

Prior to the economic crisis, development and inter-governmental organizations like the European Union (EU), Mercy Corps, and the UNDP were more actively engaged with the Lebanese government, EDL, and other sector stakeholders to drive energy reforms in Lebanon. They financed major infrastructure projects like transmission line upgrades and energy efficiency loan schemes to improve the sector.[74] However, due to the crises and the unavailability of credit facilities or loans from the banking sector, projects shifted to the private sector and MSMEs, with a greater focus on decentralization. As an example, the EU supports private sector programs, like CEDRO, focused on nurturing startups, innovation, and green enterprises related to sustainable energy.[75] Nonetheless, even with a greater focus on the private sector and the implementation of programs such as CEDRO, the financial constraints caused by the crisis rendered many small businesses unable to provide the co-financing requirements for donor-led initiatives, leading to a focus on larger industries that are more financially stable.[76]

Key informants highlighted the importance of development financing for projects targeting MSMEs as one of the very few available alternatives to support the different sectors until larger reforms and sector-supporting policies are implemented or put in place.[77] However, these support instruments and projects are more likely to be channeled to larger, more financially stable, enterprises that have more leverage potential and ability to cost share as compared to MSMEs.

The financial crisis also severely limited MSME participation in renewable energy initiatives by development agencies. For instance, for a 2019-2024 EU project by UNDP providing grants for innovative renewable energy and efficiency technologies, UNDP approached around 40-50 stakeholders, but only a few large industries could participate

70 Interview with an energy finance expert (Interviewee 2, 2024).

71 Interviews with a LPSN member, a public servant at the Ministry of Energy and Water, and a public servant at the Ministry of Economy and Trade (Interviewees 5,8,12, 2024).

72 Interviews with a PhD candidate, Cornell University, a LPSN member, a MSME owner, and a public servant at the Ministry of Industry (Interviewees 1,5,14,15, 2024).

73 Interview with a public servant at the Ministry of Agriculture (Interviewee 13, 2024).

74 Interviews with a manager at a UN organization, an international donor representative, and a representative of an international organization (Interviewees 4,9,10, 2024).

75 Interview with an international donor representative (Interviewee 9, 2024).

76 Interview with a manager at a UN organization (Interviewee 4, 2024).

77 Interviews with an energy finance expert, a public servant at the Ministry of Industry, and a woman-owned agro business (Interviewees 2, 15, 20, 2024).

as MSMEs faced economic constraints and lack of funding.[78] Other hurdles included lack of knowledge about prioritizing lower-cost energy efficiency measures before making renewable energy investments, as well as quality and sustainability concerns with some renewable energy technology suppliers and installers operating in an unregulated market boom.[79]

The agricultural sector is seen as an important sector that has substantial potential and is currently experiencing growth.[80] A key informant from the Ministry of Agriculture (MoA) reported that they are facing a range of challenges related to the impact of the energy crisis on MSMEs in the agricultural sector. The rising cost of diesel, particularly for irrigation purposes, is putting pressure on production expenses along with other inputs like fertilizer and seeds. To help in overcoming some of these challenges, the MoA has mainly operated in an advisory role (pre-crisis), and today can only aim at sharing the importance of adopting best agricultural practices and embracing new technologies for more efficient irrigation methods.[81] Yet, more state intervention is needed when it comes to increasing customs duties on imported goods and allow more competition for local products.[82]

On the other hand, the industrial sector in Lebanon is facing its own set of challenges, exacerbated by the energy crisis and long-standing banking sector difficulties. The lack of a clear subsidization policy since 2019 has made things worse for the sector, highlighting the need for transparent mechanisms to support MSMEs and various industries. Financial constraints limit the Ministry of Industry's (MoI) ability to directly support local industry. This has led the MoI to seek collaborations with external funders and the private sector, and to engage with stakeholders like the Association of Lebanese Industrialists (ALI) and the Ministry of Economy and Trade (MoET) in an effort to overcome some of the challenges facing the industrial sector in Lebanon.[83]

Nevertheless, some policies, financial instruments, training programs, and technology initiatives were developed before and during the crisis, seeking to facilitate the involvement of micro, small, and medium enterprises in the energy transition. This included the National Renewable Energy Action Plan (NREAP), National Energy Efficiency Action Plan (NEEAP), building energy labeling systems, dedicated financing mechanisms, and capacity building efforts, primarily led by institutions like the Lebanese Center for Energy Conservation (LCEC).[84] In addition,

78 Interviews with managers at UN organizations (Interviewees 4, 11, 2024).

79 Interviews with a manager at a UN organization and a woman-owned agro business (Interviewees 11, 17, 2024).

80 Interview with a woman-owned agro business (Interviewee 17, 2024).

81 Interview with a public servant at the Ministry of Agriculture (Interviewee 13, 2024).

82 Interview with a woman-owned agro business (Interviewee 17, 2024).

83 Interview with a public servant at the Ministry of Industry (Interviewee 15, 2024).

84 Interview with a public servant at the Ministry of Energy and Water (Interviewee 8, 2024).

a new law was drafted that caters to MSMEs and their development, and is awaiting the formation of a new government to be ratified.[85]

A major recent development was the passing of the new Distributed Renewable Energy (DRE) law in 2023 (law 318/2023), which for the first time allowed private sector entities including MSMEs to produce and sell renewable energy up to 10 MW directly using the national grid, opening up business opportunities across the value chain, like construction, operations, maintenance, and management.[86] While the DRE law faced implementation challenges, like the need to establish the Energy Regulatory Authority (ERA), it was viewed as a pivotal step in potentially catalyzing MSME participation in the energy transition.[87] Specialized services like quality control, monitoring, and third-party verification also emerged as potential new market niches for energy-focused MSMEs.[88]

Lebanon's energy transition was also characterized by community-led initiatives focusing on women and youth empowerment. One initiative, for example, focused on training women for jobs in the construction and energy sectors, and was successful in this regard, as many participants went on to find employment in these fields. However, the project faced challenges, like resistance from some religious parties and municipalities, and was not as successful in facilitating women's entry into leadership positions within these sectors.[89] This aligned with broader observations that while the energy transition has created some opportunities, it did not appear to be dramatically shifting entrenched gender imbalances in the overall workforce and leadership of the energy sector itself so far.[90]

In addition, and even during the pre-crisis period, a significant challenge existed and continues to exist more profoundly today linked to the informal sector. It was reported that between 45-70% of economic activity in Lebanon operated informally without paying taxes and duties, severely undermining the competitiveness of formal, tax-paying MSMEs that faced 30-40 percent higher operational costs compared to informal businesses, not to mention severely impacting the state's revenues and budget.[91] Furthermore, for the energy sector, standardization and enforcing regulations remains a challenge. Concerning solar energy standards, part of the standards are mandatory while other standards are on their way to becoming mandatory through a decree.[92] One example of a mandatory standard is Decree 6997 regarding solar standards.

85 Interview with a public servant at the Ministry of Economy and Trade (Interviewee 12, 2024).

86 Interview with a public servant at the Ministry of Energy and Water (Interviewee 8, 2024).

87 Interview with a public servant at the Ministry of Energy and Water (Interviewee 8, 2024).

88 Ibid.

89 Interview with a member of a community-led initiative focusing on women and youth empowerment (Interviewee 7, 2024).

90 Interview with a PhD Candidate, Cornell University (Interviewee 1, 2024).

91 Interviews with a LPSN member, a public servant at the Ministry of Economy and Trade, and an ICT company representative (Interviewees 5, 12, 24, 2024).

92 Interview with a public servant at the Lebanese Standards Institution (Interviewee 16, 2024).

Funding remained the major challenge for MSMEs aiming to adopt clean energy technologies like renewable energy systems. Amidst the challenges, some emerging opportunities were identified for MSME involvement in the energy transition. The digital sector garnered particular focus as a key avenue providing educated youth and women with opportunities in energy-aligned services like digital marketing, translation, videography, and online sales platforms.[93] Furthermore, some companies that work in the ICT field reported that the quality of human resources makes Lebanon competitive and that venturing into new markets or strengthening their existing operations abroad was one key element to adapting during the crisis.[94] Companies have grown accustomed to relying on themselves and being resilient in the face of challenges in the absence of state support.

The agricultural sector also shows potential for the adoption of new technologies such as agrivoltaics that would transform their already existing high utilization of conventional solar systems to systems that would better integrate with their farming process.[95] Additional sector needs and potential enabling opportunities and transition pathways that were reported from the different key informants included: a) diversifying the technological landscape for the adoption of renewable energy solutions for industries and MSMEs (such as bioenergy), while developing local vocational capacities for such systems to be integrated sustainably,[96] b) capitalizing on the market-driven solar PV boom and the distributed nature of current power generation assets to leap-frog into smart grids and enhance the transmission and distribution network to improve efficiency and reliability of the overall energy sector, c) increase the energy storage capacity by utilizing pumped hydro and capitalizing on Lebanon's mountainous landscape. This comes with a need for the Electricity of Lebanon (EDL) to adapt to the changing energy landscape by focusing on digitalization, decentralization, and flexibility in order to support the energy transition.[97]

In summary, while the pre-crisis period allowed for some policies and initiatives to facilitate MSME involvement in the sustainable energy transition, the economic crisis created extremely challenging conditions, like lack of access to financing, high operational costs, and unfair competition from the pervasive informal sector. Overcoming financing constraints was consistently highlighted by interviewees as the biggest priority to truly unleash the potential of MSMEs as drivers of Lebanon's energy transition. However, new opportunities also emerged in areas like

93 Interview with a representative of an international organization (Interviewee 10, 2024).

94 Interviews with ICT company representatives (Interviewees 22, 23, 2024).

95 Interview with a public servant at the Ministry of Agriculture (Interviewee 13, 2024).

96 Interview with a manager at a UN organization (Interviewee 4, 2024).

97 Interviews with a PhD candidate, Cornell University, president of an NGO active in the renewable energy sector, and a public servant at the Ministry of Energy and Water (Interviewees 1, 3, 8, 2024).

digitalization, e-commerce, distributed renewable energy investments enabled by the new legal framework, and localized municipal hybrid mini-grid models reviving local businesses. These can potentially open the space for new applications and economic activities in several areas such as: a) vocational capacity building to meet the requirements of the energy transition, b) adoption of additional renewable energy and energy efficiency technologies, such as biogas, wind, concentrated solar, geothermal and heat pumps, and c) digital solutions and applications, such as smart grids and distributed energy resource management systems.

Such pathways can have attributes of symbiotic growth and development between the Lebanese energy and economic landscape, on the one hand, and local MSMEs on the other. Existing expertise and capacities within the fields of digital transformation, ICT and energy technologies would optimally be leveraged to turn critical crisis repercussions, infrastructural and socio-economic, into opportunities for an enhanced and expedited transition into a sustainable energy system (digital solutions can help MSMEs reduce their carbon footprint[98]).The implications of such a scenario have the potential to create a virtuous cycle between MSME growth, energy system development, economic development, and social and environmental support.

98 Interview with ICT company representative, provider of digital solutions (Interviewee 23, 2024).

VII Discussion

Results from both the quantitative data collected, through a firm-level survey, and qualitative insights from focus group discussions and key informant interviews offer insights into the challenges and opportunities for MSMEs operating in the context of the clean energy transition in Lebanon. Confronted with compounded economic and energy crises, the business environment has been directly impacted, creating a set of new challenges for MSMEs across various sectors. Notwithstanding, some of these MSMEs have been resilient, adaptive, and innovative enough to reposition themselves as 'thrivers' amidst all these adversities. The main findings raise several layers of policy interventions that can be powerful tools for working towards the empowerment of MSMEs to navigate existing economic, energy, and social challenges.

Lebanon stands today at a critical juncture when it comes to its energy transition path, and consequently the role MSMEs can play in this future. Policy decisions made today will impact how the country will look like for at least a decade. One of the key lessons from the

ongoing crisis is the need to strengthen the productive sectors, manufacturing and agriculture, to play a bigger role in the economy. Strengthening MSMEs and enabling the environment for them to innovate fall in this direction. Although some MSMEs were able to find some opportunities to grow during the crisis, the accumulated benefits have already been phased out with ongoing hyperinflation. Thus, the current business environment will not be supportive and will not create sustainable opportunities.

Operating in a crisis scenario has been the trend for most Lebanese MSMEs. The country's political economy and its unique form of development post-civil war is one key aspect at the root of social, environmental, and economic difficulties that were and continue to be lived as part of the 'normal' mode of business operation. The banking, real estate, and services industries were the main areas of development during that time (pre-2019), with a focus on the expansion of the private sector and its integration into the global economy. This has resulted in increased socioeconomic injustices, with policies largely benefiting the political and economic elites of sectarian communities through the numerous privatization schemes and the clientelist allocation of state contracts.

For the majority of the so-called unaffiliated MSMEs, this meant adapting and innovating their day-to-day operations in the face of difficulties stemming from the macroeconomic and political environment. Highlights of these issues include a macroeconomic context that offers little opportunity to thrive, significant skills gap, limited access to credit, inadequate government services, unreliable infrastructure, difficulty in doing business (registration, taxation, insurance, informal economy), limited global market access, and vulnerability to continuous climatic or social unrest events. In this context, international development organizations, foreign and diaspora support, along with a select of government policies (start-up support/incubators, MSME development strategies by local ministries, and other) were considered paramount for the survival and continuity for many businesses, even in the face of structural challenges.

These structural and macroeconomic challenges were only exacerbated by the economic and banking crisis, the Covid-19 pandemic, and the Russia-Ukraine conflict, which not only exacerbated existing difficulties, but also led to the reduction of government and inter-governmental efforts that were key to sustaining the sector.

Such multidimensional challenges would mean that any comprehensive policy on MSMEs and the energy transition has to consider full-scale financing mechanisms, regulatory reforms, capacity-building initiatives, export strategy, creation of markets, and stakeholder collaboration capable of enhancing innovation, resiliency, and sustainability in this sector. The research findings underscore just how integral MSMEs are to a clean energy transition. Engaging MSMEs as active partners in the transition would enable Lebanon to unleash these enterprises' full entrepreneurial spirit, innovative capacity, and agility to deliver strong economic growth, employment generation, and environmentally sustainable development.

VIII Recommendations

Our research has revealed a seemingly contradictory picture of Lebanese MSMEs as they struggle through a series of crises. On the one hand, the study has reflected the structural issues, challenges, and bottlenecks that MSMEs are left to deal with at the policy, financial, and institutional levels, while on the other hand, it has shown their capacity to adapt, innovate, and thrive even in the most difficult circumstance.

Those structural issues are usually tackled using the traditional top-down approach, by bringing forward high-level regulatory and financial instruments, but this approach is typically missing the on-ground realities those enterprises are facing.

As a consequence, it becomes evident that a) enhancing the regulatory framework, b) creating innovative financing models that meet particular MSME needs, c) increasing the skilled workforce by investing in training programs and capacity building, d) empowering youth and increasing knowledge-sharing, and e) fostering collaboration between MSMEs and beyond with donors and international organizations are all key policy issues to be tackled with a bigger urgency than the pre-crisis era.

Yet, these policy instruments should also consider the current emerging realities, as well as placing Lebanon in the broader context of the energy transition that is taking place in the MENA region. Thus, this study builds on existing research and complements it by proposing strategic measures that would contribute to developing the capacities of the existing MSME and energy landscape in Lebanon.

- **Scaling-up support for distributed renewable energy systems**
  While municipal distributed projects have provided a great example of community-led processes, the supporting policies to such initiatives need to be scaled-up to provide adequate funding, technical assistance, quality control and monitoring, and develop partnerships between the local businesses and residents. Although the approved distributed RE law is a step in the right direction, it is not sufficient alone to support an inclusive social, economic, and environmental development process.

- **Shifting strategies**
  Shifting strategies from the services and financial sectors to more productive sectors in a climate-smart pathway by empowering the agricultural, agro-food, tourism, and ICT (digital transformation and technology) sectors is key. The technical capability of local solution providers that this research has encountered is a cornerstone to significantly enhance their operations, particularly at the energy supply end (cheaper and reliable alternatives), and the energy consumption and operations end (applying technology for resource optimization and enhanced agricultural and farming techniques, resource management software and systems, demand-side management, smart-metering, and storage integration), in addition to building their capacities to be able to enter the export market gradually. These sectors need to leverage the existing know-how and aim for cross-sectoral collaborations, especially in the fields of digital transformation and technology adoption.

- **Restoring trust and dealing with the informal sector**
  Enabling the environment for a sustainable growth of MSMEs in Lebanon cannot be imagined in the current abnormal conditions the country has been going through since the economic collapse. Solving the major macroeconomic issues is necessary to stabilize and ensure public finances are put on a stable trajectory and avoid further temporary solutions that simply delay any kind of real resolution. In addition, the restructuring of the banking sector must be a top priority, in order to restore trust, open future pathways for green financing and investment opportunities, and start planning for a sustainable and resilient green transition. Moreover, dealing with the informal economy is another priority for

both government and business owners. Given the stark negative impact that the informal economy has on both government revenues and the formal MSME sector (due to illegitimate competition[99]), tackling this with strategic regulatory instruments would create benefits with multiple dividends for the overall economy. Creating incentives for MSMEs to join the formal economy such as tax breaks for micro enterprises, providing easier access to formal credit facilities, increasing access to formal markets for products and services, and creating networking opportunities and platforms for MSMEs to connect with formal businesses, government agencies, and other stakeholders can be some of the applications. It is important to note that jobs in the informal sector do not have the same protection as others, especially when it comes to women and youth.

99 Lebanon is one of the very few countries that does not have an implemented competition law.

- **Building capacity to assess climate risks**
  Beyond macroeconomic and banking sector considerations, it is crucial to take into account the climate's impact on the overall economy as well as on individual sectors, which are still overlooked. There is an urgent need to build local capacities in order to empower both public servants and private actors to realistically assess climate risks and take into consideration the associated impacts in developing future plans.

ANNEX 1

Table 1 **List of Key Informants**

Interviewee Number	Affiliation/Institution	Date of Completion (M/D/Y)
1	PhD Candidate, Cornell University	3/8/2024
2	Energy Finance Expert	3/15/2024
3	President of an NGO active in the Renewable Energy sector	4/4/2024
4	Manager at a UN Organization	4/5/2024
5	LPSN - Earth Technologies	4/17/2024
6	Manager at a UN Organization	4/23/2024
7	Member of a community-led initiative focusing on women and youth empowerment	5/7/2024
8	Public servant at the Ministry of Energy and Water	5/7/2024
9	International Donor Representative	5/17/2024
10	Representative of an International organization	5/22/2024
11	Manager at a UN Organization	5/23/2024
12	Public servant at the Ministry of Economy and Trade	5/30/2024
13	Public servant at the Ministry of Agriculture	5/31/2024
14	MSME owner	5/31/2024
15	Public servant at the Ministry of Industry	6/5/2024
16	Public servant at Lebanese Standards Institution	6/11/2024
17	Agro-business, uses RE, owned by women	6/24/2024
18	Agro-business, uses RE, employs 4 part-time women	6/26/2024
19	Agro-business, does not use RE, family business	6/27/2024
20	Agro-business, uses RE, owned by women	6/27/2024
21	Agro-business, does not use RE, not owned by women	6/28/2024
22	ICT company, investment services for RE projects	7/4/2024
23	ICT company representative, provider of digital solutions	7/8/2024
24	ICT company representative, provider of data and internet services	7/10/2024

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