Clean Energy Business Council

مجلس صناعات الطاقة النظيفة

Middle East & North Africa

الشرق الأوسط وشمال افريقيا

Venture Capital in MENA Climate Tech

WHITE PAPER

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The Clean Energy Business Council (CEBC) is a non-profit organization dedicated to promoting clean energy, including renewables, climate finance, future mobility, energy efficiency, smart grid, energy storage and clean energy technologies and solutions. Established in 2008 by a group of leading institutions, companies and individuals who recognized the potential for a clean energy revolution in the Middle East and North Africa (MENA) region, the CEBC creates a forum for stakeholders to come together to exchange ideas, share information and facilitate projects. CEBC provides a platform to further dialogue between the public and private sectors to develop much-needed policy and regulations to help drive the implementation of clean energy across the MENA region.

The Climate Finance Working Group of the CEBC aims to develop and execute a strategy to encourage federal governments across the MENA region to include consideration for financing opportunities and reduce barriers for banks and other investors to develop clean energy solutions that address climate change in collaboration with its partners and with the rest of CEBC working groups. The working group enables the above by identifying the concerns and barriers for financial organizations and by developing policy papers that address those concerns, particularly investment banks, institutional and individual investors, insurance companies, and energy developers. **Learn more about CEBC:** https://www.cebcmena.com

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EXECUTIVE SUMMARY

The Middle East and North Africa (MENA) region is particularly vulnerable to adverse effects of climate change. According to the World Bank, the extreme heat will reduce the number of agricultural lands and make certain regions unliveable. The commitment to the 2015 Paris Agreement to keep the global temperature below 2°C and the urgency to shift to a greener economy creates an unprecedented opportunity for climate tech startups. At the global level, there has been a significant improvement in the value of venture capital (VC) investment in climate technologies over the years. In the period from 2013 to 2019, the total venture funding had a more than 3,750% increase. However, the MENA region's share in the VC investment in climate tech is quite limited, standing at only around 1.5% of the total VC investment made between 2013 and 2019.

Currently, the MENA region is witnessing a strong momentum in its VC industry, especially within the e-commerce, real estate, and fintech spheres. Despite the surge in the number of Climate Tech startup solutions, their number is still limited, and this is, partially, because the Climate Tech startup ecosystem in the MENA region is not yet sufficiently developed to provide a supportive and enabling environment to startups. However, this is where private funding becomes particularly vital to the expansion of the startup environment. By channeling private funding into Climate Tech startup solutions, and providing them with sufficient financial backing, these startups will be able to introduce innovative solutions that tackle climate change-related issues, which can then be implemented on a local and regional level.

This paper is based on a benchmarking study with the largest VC regions, interviews with key stakeholders in the MENA climate tech landscape, and a survey conducted by the CEBC and distributed across investors in the MENA region. The purpose of the study is to identify the key barriers to a more abundant private investment in the MENA region's climate tech startups and to propose recommendations to different stakeholders to define a clear roadmap.

Key Barriers in MENA Region's Climate Tech Startup Ecosystem

There appear to be several factors that impede VC investment in Climate Tech startups in the MENA region. The MENA's Climate Tech startup ecosystem is comprised of various actors, ranging from the public sector to the private sector, such as corporations, incubators, accelerators, investors, etc. Different players' actions and/or challenges have an impact on the other players.

The Impact of Governments

Regulation and policy barriers: The structure and the system of the energy market in the MENA countries limit the ability of entrepreneurs to explore and exploit new opportunities. Alternatively, in the West, the recent deregulation of the energy sector and the privatization of generation and distribution have fostered a more competitive environment where different utility companies can participate in these activities, which boosts innovations.

Complex administration: In the MENA region, the costs of starting a small to medium-size limited liability company are substantially high, and the procedures are cumbersome. This is a factor that affects not only the establishment of Climate Tech startups in the region but also all new businesses.

Complexity from local considerations: The MENA region is highly heterogeneous and local market considerations present specific barriers to investment, especially since investment confidence follows geopolitical stability and macroeconomic risk in general.

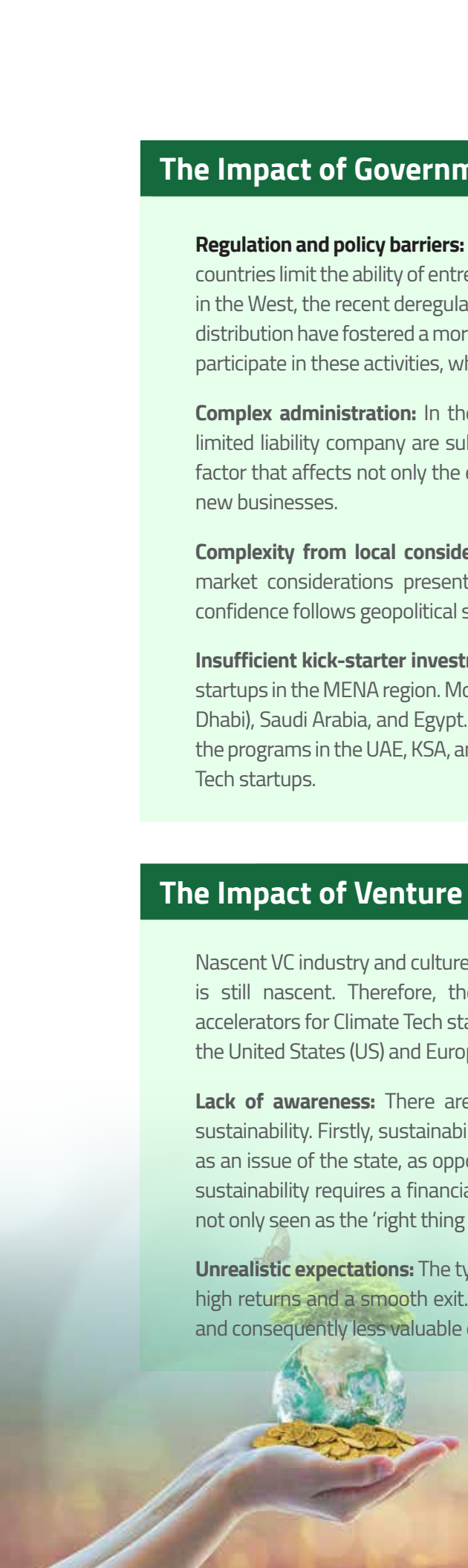
Insufficient kick-starter investment: There are several public and private programs that assist startups in the MENA region. Most of these programs are located in the UAE (Dubai, Sharjah, Abu Dhabi), Saudi Arabia, and Egypt. However, the rest of the region lacks these initiatives, and even the programs in the UAE, KSA, and Egypt are not well-tailored to the specific needs of the Climate Tech startups.

The Impact of Venture Capital Firms

Nascent VC industry and culture: In the MENA region, despite the growing trend, the VC industry is still nascent. Therefore, there are no examples of specialized funds and incubators/ accelerators for Climate Tech startups in the region; however, there are a number of examples in the United States (US) and Europe.

Lack of awareness: There are two key considerations that potentially impact funding for sustainability. Firstly, sustainability is oftentimes regarded as a 'luxury'. Secondly, it is often seen as an issue of the state, as opposed to the private sector. In Western countries, the notion that sustainability requires a financial sacrifice has been rejected, as sustainable investment is now not only seen as the 'right thing to do' in an ethical sense but is also a profitable endeavor.

Unrealistic expectations: The typical VC funds are looking for a 'home run' investment with very high returns and a smooth exit. Climate Tech is portrayed as a less interesting, less innovative, and consequently less valuable endeavor.



Recommendations

Our research has highlighted different barriers to abundant private investments in Climate Tech startups in the region. In the MENA region, different actors place different challenges on the Climate Tech ecosystem, resulting in both insufficient scaling and funding of startups. Addressing these barriers is important in order to boost the amount of private capital deployed in Climate Tech startups, which in turn, will aid in the quest to meet net zero emissions before 2050.

Recommendations for Policymakers

- **Conduct detailed analysis to define a roadmap:** At the bottom of every solution that can be brought to create a supportive environment for Climate Tech startups, there should be meticulous analysis. National policymakers should conduct a thorough analysis that can then serve as a foundation for debates regarding the impacts of different strategies for decarbonizing different sectors. Then, policymakers need to determine which areas need action and create a roadmap that will serve as a guide to achieve the needed changes.
- **Build a Climate Tech ecosystem:** The MENA policymakers can help build a supportive environment by utilizing a variety of tools and methods:
    - **Develop the policy framework:** Governments and policymakers have a crucial part in developing a supportive ecosystem for Climate Tech startups as well as investors.
    - **Government leadership to encourage investments:** Governments should play a leading role both in terms of stimulating innovation and encouraging VC and Private Equity (PE) investors to allocate more of their capital into the climate tech sphere. Stimulus investments in climate technologies can increase job creation and attract investors' attention in this sphere. By being more involved in the earlier-stage and riskier projects, the governments can utilize their different funding instruments to support Climate Tech startups.
    - **Establish public-private partnerships (PPP):** It is important for all stakeholders – governments, state-owned enterprises, and the private sector – to work together to support and make sure that ambitious policies can be implemented.
    - **Utilising government funding to support R&D work:** The MENA governments can allocate a budget for research institutions that are pursuing R&D for cleantech solutions.
    - **Build more accelerator/incubator programmes specialized for Climate Tech startups:** Governments can help the Climate Tech entrepreneurial ecosystem by establishing more accelerator/incubator programmes.

Recommendations for Venture Capitalists (VCs)

- **Be aware of the opportunities:** The VCs in the region need to be more aware of the unique opportunities that the Climate Tech startups offer and the solutions that they bring to the world's most pressing issues. They need to be cognizant of the strategic opportunities that Climate Tech offers, especially during the Covid-19 recovery period, and in light of the Paris Agreement deadlines.
- **Consider establishing dedicated Climate Tech venture funds:** Due to the nascent nature of the VC culture in the region, it may be challenging to establish dedicated Climate Tech venture funds, it is nonetheless of crucial importance to develop the ecosystem.
- **Increased engagement from the Corporate Venture Capitalists:** In addition to individual VC funds, the active participation of corporate venture capitalists is crucial to the development of the Climate Tech ecosystem for numerous reasons. The corporations in the region can develop effective and robust models to form mutual relationships with the Climate Tech startups, which would also be beneficial for corporations' non-financial performance.

Recommendations for Venture Capitalists (VCs)

- **Offer courses on climate change and sustainable development:** One of the fundamental barriers that Climate Tech startups are facing is the limited climate change, and Climate Tech awareness in the region.
- **Build climate tech innovation hubs within the university:** Universities can introduce innovation hubs to foster a more entrepreneurial spirit amongst students, thus encouraging them to take part in the scaling up, industrializing nascent innovations and making long-established activities agile. The university innovation hubs should give access to R&D facilities within the university to boost more innovation.

In conclusion, urgent action needs to be taken to tackle the climate crisis. Building up the commercialization and scalability of these new technologies through funding is crucial, especially given that there are only 10 years left to limit global warming to 1.5°C. Further, as the MENA region is particularly vulnerable to the adverse effects of climate change, the region's Climate Tech ecosystem needs a swift and sufficient boost in capital and needs to acquire all the necessary resources to reach its potential.

INTRODUCTION

Although the MENA countries are rich in diversity and have their own social, political, and economic systems, they face similar environmental challenges, which affect their stability and security.

The Middle East and North Africa (MENA) region is particularly vulnerable to adverse effects of climate change. According to the World Bank, the extreme heat will reduce the number of agricultural lands and make certain regions unliveable. Twelve of the fifteen most water-scarce states are situated in the MENA region (PRB, 2021). Water stress occurs when annual water supplies fall below 1700 m3 per person per year. Water scarcity is defined as when water supplies fall below 1000 m3 per person per year, and anything below 500 m3 is defined as "absolute scarcity" (UNCWS, 2012). The region also faces serious challenges pertaining to air quality, waste management, and growing energy demand. These issues are exacerbated by population growth.

To address one of the region's most pressing problems, the MENA countries signed the 2015 Paris Agreement and committed to keep the global temperature rise below 2°C and to pursue efforts to limit the temperature increase even further to 1.5°C. On October 7th, 2021, the United Arab Emirates (UAE) became the first MENA country to pledge to achieve net-zero emissions by 2050. Saudi Arabia and Bahrain have also pledged to reach net-zero emissions by 2060. However, given that the MENA region is heavily dependent on oil and struggles with inefficient consumption of energy, innovative solutions are needed to ensure that MENA countries meet their emissions reduction targets. Climate Tech startups can aid MENA countries in achieving their emissions reduction targets, as they present technological solutions that tackle climate change across a wide range of sectors, e.g., mobility, clean energy, agriculture, industry, etc. However, despite the fact that they are crucial to tackling climate change, venture capital (VC) investments in the MENA's Climate Tech startups are scarce. The purpose of this paper is to explore the key barriers to a more abundant VC investment landscape in climate tech in the region and propose recommendations to unlock the region's potential and pave the way for MENA to become a Climate Tech hub.

Historical Context of the Global Climate Tech Market:

Between 2005 and 2007, the clean energy industry experienced annual growth rates of about 40%. According to a report by the MIT Energy Initiative, venture capitalists spent approximately $25 billion on clean energy technology between 2006 and 2011 (MIT, 2016). However, the 2000's cleantech investment boom ended in disaster with venture capitalists losing more than 50% of their investments. This has in turn resulted in investment reluctance and fear. Despite the first failure, private investment in Clean Tech surged once again; this time with a broader perspective of sustainability.

Cleantech vs. Climate Tech

Climate tech is a broader term than cleantech and encompasses all areas that can help with decarbonizing the economy. While clean tech mainly focused on the energy sector, climate tech focuses on a wide range of areas such as heavy industry, mobility, food, agriculture and land use, energy, etc.

VC investment grew more than ten times between 2014 and 2020 (Figure X1). Nowadays, the industry is entering a pull model instead of a push model as more governments have started encouraging the private sector to increase their investments in sustainable solutions. However, some climate technologies attract more attention and investment than others. Today's mobility and transportation sector represents 63% of total Climate Tech funding between 2013 and 2019; and out of 43 Climate Tech startups that were valued more than 1 billion dollars, 30 of them were mobility and transport startups (PwC, 2020). The sector experienced advances in technology, which increased efficiency and customer demand. Although the electrification of light vehicles has received ample attention, the electrification of various modes of transportation (e.g., trains and air transport) is also beginning to be an area of focus.

1 Axios. (January 14, 2021). Value of venture capital investments in climate technology worldwide from 2009 to 2020 (in billion U.S. dollars) [Graph]. In Statista. Retrieved March 29, 2021, from https://www.statista-com.ezp.essec.fr/statistics/1197389/global-climate-tech-venture-capital-investment/

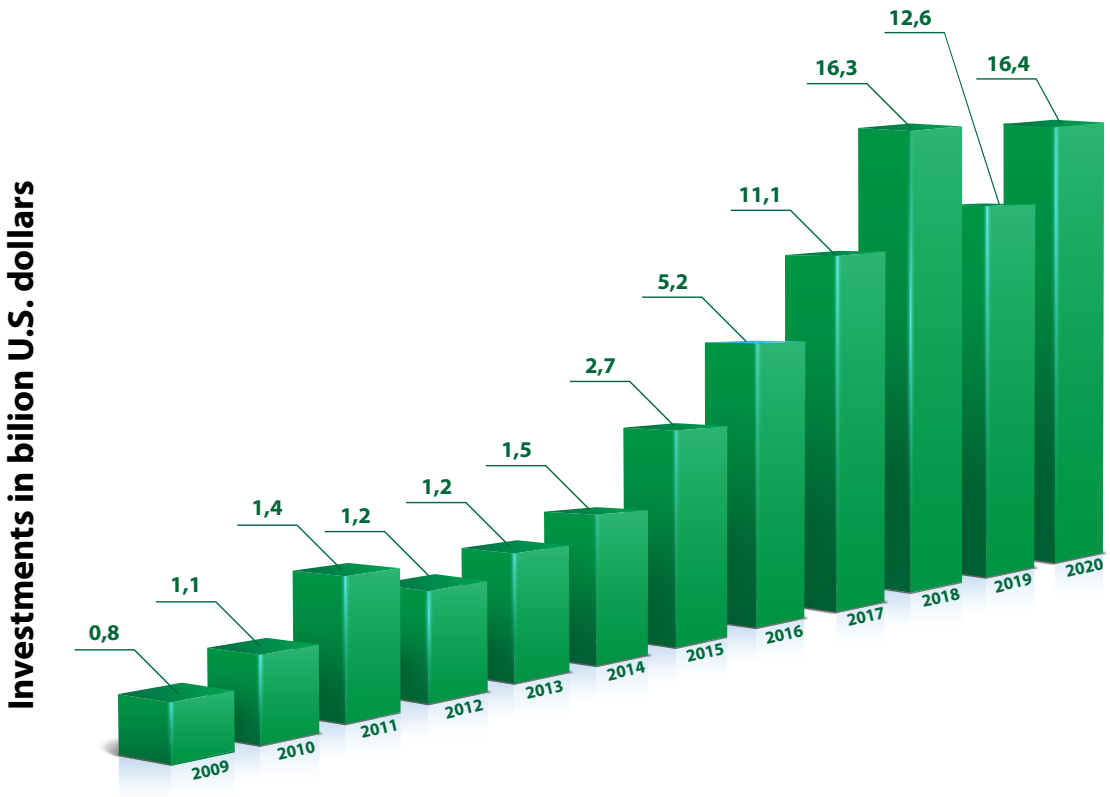


Figure 1: Value of venture capital investments in climate technology worldwide from 2009 to 2020 (in billion U.S. dollars)[1]

Another area that has gained traction from VC investors is agriculture. In 2019, there were 162 agriculture funding rounds compared to 21 in 2013 (PwC, 2020). The agricultural sector also has the second-highest number of unicorns, after mobility and transport. Given that agriculture is a crucial sector, it attracts a large number of investments. Although other Climate Tech areas such as climate data generation and Greenhouse Gas (GHG) capture and storage are still nascent, they will play a pivotal role in reaching net-zero targets.

[1] Axios. (January 14, 2021). Value of venture capital investments in climate technology worldwide from 2009 to 2020 (in billion U.S. dollars) [Graph]. In Statista. Retrieved March 29, 2021, from https://www-statista.com.ezp.essec.fr/statistics/1197389/global-climate-tech-venture-capitalinvestment/

According to a 2020 PwC report, the top 3 regions in terms of Climate Tech are North America, China, and Europe (Figure 2). These 3 regions alone covered around 93% of the total VC investments in Climate Tech made between 2013 and 2019. While VC investment in climate technologies was more focused on mobility and transportation, investments in Europe were dominated by the energy sector (Figure 2). However, the data shows that 78% of the investors had two or fewer Climate Tech deals in total and only 0.37% of the investors had more than three Climate Tech deals per year on average.

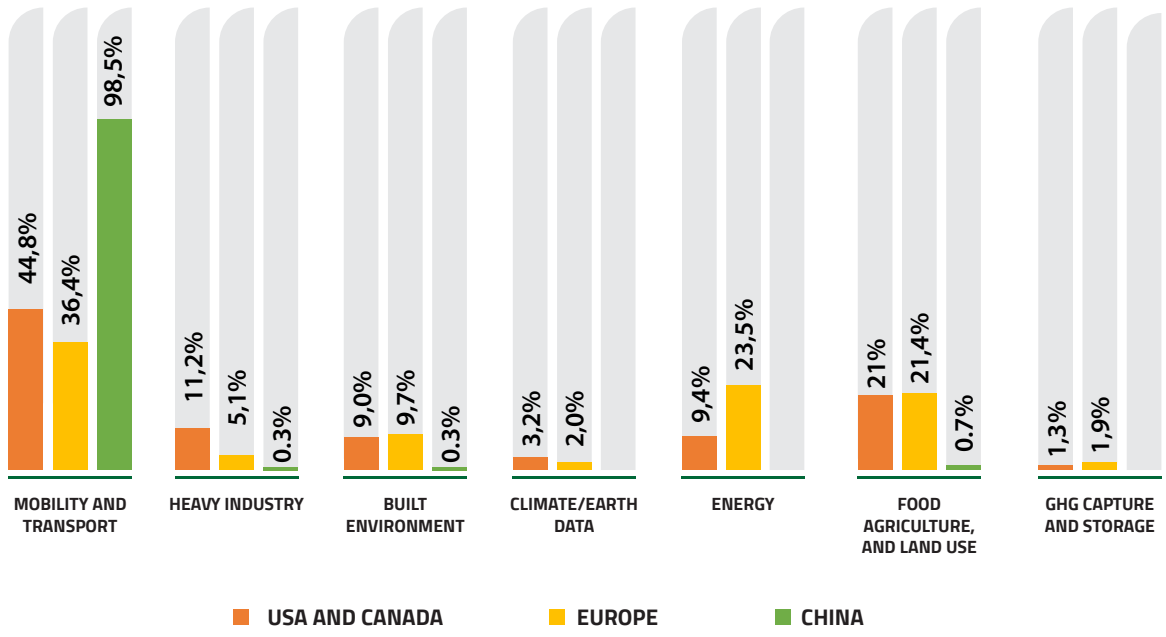


Figure 2: Distribution of venture capital investments in climate technology startups in the US and Canada, Europe, and China between 2013 and 2019, by segment

How can a well-developed climate tech landscape help the MENA region?

The benefit of Climate Tech startups to the region is immense, as they can provide cleaner and more cost-effective solutions to address climate change. They can also result in significant job creation and economic growth. The region can benefit from the overall momentum of the VC industry, and channel the resources towards funding Climate Tech startups that provide niche and well-tailored solutions. The development of such an ecosystem can also encourage more public-private partnerships (PPPs), which would provide a multitude of socioeconomic benefits.

Key Steps Towards Development in the Climate Tech Sector

Generally, there are several criteria that VC firms want to see in order to invest in a startup. The most common criteria are a scalable business model, a large market size, and the ability to exit with at least 2x or 3x returns. Therefore, there are several industries that VC funds tend to focus on, such as e-commerce, healthcare, FinTech, and IT. However, Climate Tech has been emerging as one of the most active investment areas, especially since 2017. There are key considerations that need to be incorporated to ensure that the mistakes of the 2000's Clean Tech boom are not repeated. Two key considerations that can aid in the development of the Climate Tech ecosystem and in sustaining the current investment boom are the inclusion of data and more established infrastructure. By doing so, the Climate Tech ecosystem can play a vital in tackling climate change and decarbonising the global economy.

When the first Clean Tech boom took place in the 2000's, there was not yet sufficient infrastructure to support the development of other sectors such as smart technologies related to clean energy and land use. Investors were also new to this energy-focused, capital-intensive field. Investors found themselves in a turbulent landscape with limited access to navigation tools. Additionally, these problems were exacerbated by the regulatory complexities that were in place at the time. However, nowadays the climate tech landscape is marginally different and provides more reasons for optimism.

What has changed since the Clean Tech 1.0 boom and burst?

In general terms around the world, today's Climate Tech context can be differentiated from that of 2000's in the following ways:

- There is more accumulated experience for the investors to manoeuvre in the challenging environment of climate tech.
- Climate tech is broader than cleantech and includes diverse sectors such as heavy industry, mobility, climate/earth data generation, and built environment. This creates a multiplicity of solutions to tackle climate change while also leveraging existing infrastructure.
- Climate change is more urgent matter than ever. In recent years, weather anomalies proliferated in way that are no longer negligible. The need to tackle climate change is no longer being questioned or seen as a problem that can be postponed but considered a vital matter. Important developments took place on a global scale to put climate change in the frontline of agendas (e.g., Paris Agreement and the Sustainable Development Goals).
- The Climate Tech ecosystem is surrounded by a more conducive environment to develop.
- Climate Tech can better serve the needs of the demand side for ESG. Nowadays, investors are considering environmental, social, and governance (ESG) aspects more when making investment decisions. This alone creates a $1 billion market for ESG data.
- Important technological advances took place which drove down the cost of renewables.
- There is a much bigger commitment from corporations to reduce their carbon footprint.

Sunlight Financial LLC – A Climate Tech unicorn leveraging existing infrastructure

Sunlight Financial LLC, valued at approximately $1.3B, has recently announced their merger with Apollo-affiliated Spartan Acquisition Corp. II. This merger has resulted in Sunlight becoming a publicly listed company.

Sunlight is essentially a lending company with a proprietary fintech platform. The company provides solar installers with the means to issue loans to homeowners to finance solar power and battery installations, in addition to other home improvement projects.

Sunlight is an exemplary case of why there is more promise in today's venture backed climate tech startups. The company successfully illustrates how nowadays climate tech startups can leverage existing infrastructure without need for major infrastructure expansions.

In order for the MENA region's Climate Tech sector to flourish, there are important lessons to learn from the past Climate Tech booms. The possible reasons that led to a revival of the sector in the US, China, and Europe should be examined in greater detail. While the previously mentioned elements are common to all the regions, there are also region-specific developments that have accelerated investments in climate technologies. The next subsections include different factors that have led to the development of Climate Tech startup ecosystems in the US, China and Europe.

The Case of the United States

The venture capitalists of the US are the biggest investors in climate technologies. In recent years, the private investment landscape has been transformed by the emergence of a new generation of Climate Tech investors. The new generation of investors is equipped with the know-how to navigate the complex ecosystem of climate technologies and have a long-term vision. Numerous entities have emerged to support the ecosystem in the last 10 years. Without the presence of these new entities, it would not be possible for climate technologies to flourish as much as they have. This is because traditional venture investors were more inclined to invest in companies that could easily scale and from which they could get 2x or 3x returns with relatively lower initial investments. Some examples of new funds that will invest in Climate Tech startups include the Amazon Climate Pledge Fund, Breakthrough Energy Ventures, and Lowercarbon Capital.

Until 2021, Climate Tech startups mostly found support from private entities in the US. However, it is expected that the new federal leadership will drive more investor enthusiasm as **President Biden has rolled out investment plans of $2B in climate science until 2025**. The US Department of Energy (DOE) also provides clean energy companies with new grants, loans, and financing programs. This news is expected to incentivize public-private partnerships in the US in the following years, hence attracting more investment from the private sector for climate technologies.

The Case of China

China is the second biggest investor in Climate Tech after the US. However, China did not earn this position overnight and out of pure coincidence. In fact, until the past decade, China was heavily dependent on technology transfer and had little indigenous innovation, which is common in most developing countries. Nevertheless, over the years China witnessed economic reform and economic development.

One of the most important reasons why we see such an evolution in China is linked to policy. One of the primary drivers for this change is policy. The Chinese Government has supported the development and application of Climate Tech sector for decades. At the United Nations (UN)'s 2015 Paris climate change conference, China took a leading position on climate policy. China's 14th Five-Year-Plan, announced in March 2021, reaffirms its commitment to achieving net-zero emissions by 2060, including raising clean energy to 20% of the energy mix by 2025 (WRI, 2021). The policies of decarbonization are in China's self-interest as it is one of the biggest emitters globally, and is vulnerable to droughts, heavy rains, and heatwaves (Zhao, 2020). China also suffers from an enormous 'health burden' because of air pollution, and the government has recognized the importance of policy in improving public health and encouraging sustainable economic growth (Hong et al., 2019).

Chinese leaders have not been isolated from the experience and knowledge that the rest of the world has been accumulating in terms of tackling climate change over years. To become an innovation hub for climate technologies, China has benefited from the global know-how and incorporated it into its national targets and plans.

By 2019, key Chinese universities had collaborations with '1100 enterprises from more than 100 countries around the world' (Ma, 2019). A partnership was formed between Rocky Mountain Institute (RMI)[2] , Lawrence Berkeley National Laboratory, the Energy Research Institute, and Energy Foundation China to form a multiparty, transnational collaboration to produce a roadmap of a decarbonized China. Additionally, the roadmap provides pathways to economic growth and decarbonization of the Chinese economy through 2050. Decades-long in-depth research has stimulated debates among leaders and key thinkers in China, especially on the topic of regulatory reforms. This research helped shape the 14th 5-year plan and shed light on how far China could go in its next set of commitments. All these efforts, multi-stakeholder discussions, and partnerships paved the way for China's 2060 Carbon Neutrality announcement. In China's case, utilizing international expertise through transnational partnerships and having an embedded culture of producing technologies (most of the senior leaders in China are engineers) has helped with their climate technology innovations and investments. It is crucial to have a destination in terms of reaching net-zero targets for countries, such as China's 2060 Carbon Neutrality target. However, it is equally important to have these targets embedded into short-term plans, e.g., five-year plans. Besides the development of cost-competitive technologies, for VC and PE investors, it is crucial to see a consistent determination on the governmental end because it ensures the demand.

[2] The Rocky Mountain Institute is a non-profit organization that was founded in 1982, in the US. Their activities include research, publication, consulting, and lecturing in sustainability, with a particular attention on profitable innovations for energy and resource efficiency.

The Case of Europe

Europe is one of the most vital players in the climate technologies sphere. Many members of the European Union have already expressed their commitment to the Paris Agreement. With the introduction of the eight pillars of the European Green deals in 2019, more opportunities have opened for startups and investors, as more solid emissions reduction targets have been introduced. The European Green Deal document also acknowledges the importance of digital technologies to tackle climate change, as it states that they are a "critical enabler for attaining the sustainability goals" of the Green Deal, across an array of sectors (European Commission, 2019). The inclusion of technology and innovation in important documents is crucial to motivate both the corporations and entrepreneurs to get more involved in climate technologies. The European Green Deal acts as an incentive to encourage investments in climate technologies.

A crucial enabler in the development of Climate Tech in Europe is the European Union's involvement in reducing carbon emissions, which goes beyond setting sheer targets. The European Union set up the European Institute of Innovation & Technology (EIT) in 2008, as an independent body of the Union. The EIT has over 1,500 partners and is the largest "innovation network" in Europe, with a mandate to drive innovation through collaboration between the private sector, education, and research. An important subgroup of the EIT is the **Climate Knowledge and Innovation Community (KIC)** which aims to "accelerate the transition to a zero-carbon, climate-resilient society". The Climate-KIC is one of the main climate innovation initiatives within the EU. The KIC programme provides initial funding and assistance to startups, which attracts customers and partners.

Although the US has more substantial VC investment in Climate Tech, Europe is a world leader in terms of climate tech innovation. This is due to the 2020 targets and the 2030 climate-energy framework introduced by the EU[3]. According to a European Commission report, 40% of global renewable energy patents were claimed by EU businesses (Europa, 2015).

EU policymakers have allocated significant budgets for climate action-related fields. In December 2020, the EU announced its 7-year scientific research initiative, **Horizon Europe**, which aims to raise EU science spending levels by 50% over the next 7 years. The programme holds a budget of €95.5 billion – the world's largest research and innovation programme, and more than a third of the budget, approximately €33 billion has been allocated to climate-related research and innovation. Other important enablers to stimulate private investment are the Innovation Fund, the Modernisation Fund, and InvestEU. All these funding instruments are crucial as they can avoid scaling back of private investment in climate technologies.

Europe is at the forefront in tackling climate change, and this can be attributed to various reasons; namely, robust political determination and strong market instruments. These two key factors provide a stable investment environment and can result in climate action innovation and abundant private investment in climate technologies.

[3] "The 2030 climate and energy framework is a communication setting out a framework for EU climate and energy policies in the 2020-2030 period. The framework is intended to launch discussions on how to take these policies forward at the end of the current 2020 framework." Source: https://www.consilium.europa.eu/en/policies/climate-change/2030-climateand-energy-framework/

In the European Union, higher level EU institutions also help with giving direction to European countries. The direction that the European Central Bank (ECB) takes, for instance, may have a significant impact on the rest of the European economies. In January 2021, the ECB set up a climate change centre to improve and assemble ECB work on climate change; this initiative proves the important impact that climate change has on the economy and ECB's policy. Leading institutions' actions and decisions to tackle climate change have a significant impact on the individual countries, policymakers, and investors.

There are several other important policy drivers urging economies to move ahead with energy transition. The EU has decreased GHG emissions by 17% since 2005 due to robust renewable energy policies such as Renewable Energy Directives (RED I and II).

Lastly, legislations such as the EU taxonomy for sustainable finance are important as they guide private sector investments in climate technologies and create a common understanding of green activities thus increasing demand.

The European Union has shown leadership in efforts of boosting private investment in climate technologies with providing the ecosystem with a comprehensive support system and tools.

- **Institutional Support**
- **Strong political determination**
- **Robust market instruments**

SNAPSHOT OF MENA's STARTUPs and VENTURE CAPITAL

The distribution of the startups across the MENA region is not equal. In 2020, the United Arab Emirates (UAE) encompassed approximately 46% of the total number of startups in the region, the largest share in the MENA region, whereas Libya had the least. Egypt and Saudi Arabia ranked second and third, respectively, in 2020 after the UAE.

The top three countries in terms of percentage share of total funding in the first half of 2020 were also the UAE, Egypt, and Saudi Arabia, respectively. The industries which had the largest number of deals in MENA in 2020 were, FinTech (16%), e-commerce (14%), delivery and transport (10%), IT solutions (6%), and food and beverage (1%).

In terms of funding deal value, the five following sectors had the largest share in H1 2020: real estate (23%), e-commerce (22%), food & beverage (14%), delivery & transport (9%), and healthcare (9%). According to Magnitt data, while later stage deals – ranging in value between $500k and $3m increased by 52%, the number of pre-seed rounds – funding round with a value less than $100k halves on year-on-year.

In 2020, MENA VC funding surpassed the $1 billion threshold for the first time. Although the crossing of this threshold is promising in terms of the further development of the venture ecosystem in MENA, Fadi Ghandour – Executive Chairman at Wamda Group, states that the region needs more than at least $2 billion of new investment in the upcoming 5 years to realize its full potential.

CLIMATE TECH STARTUP ECOSYSTEM IN THE MENA REGION

The total amount of venture funding flowing to MENA's Climate Tech startups is fairly limited. According to PwC data, only 1.5% of the total venture capital funding in Climate Tech startups was allocated in the MENA region (Figure 3).

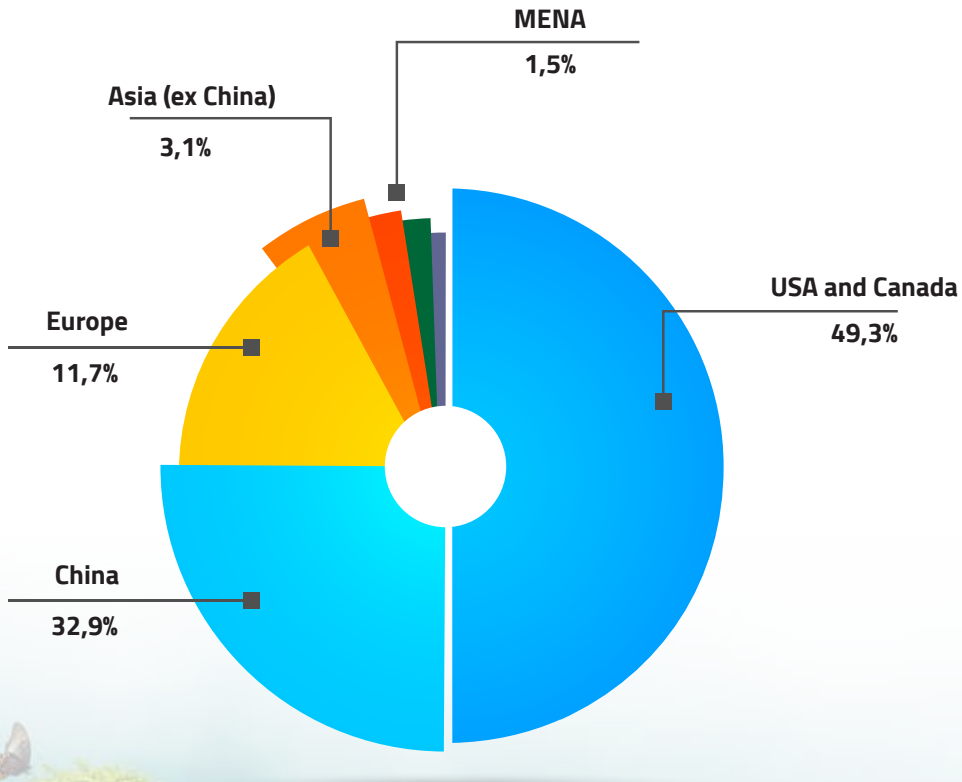


Figure 3: Venture Capital investments in climate technology startups per region (between 2013 and 2019)

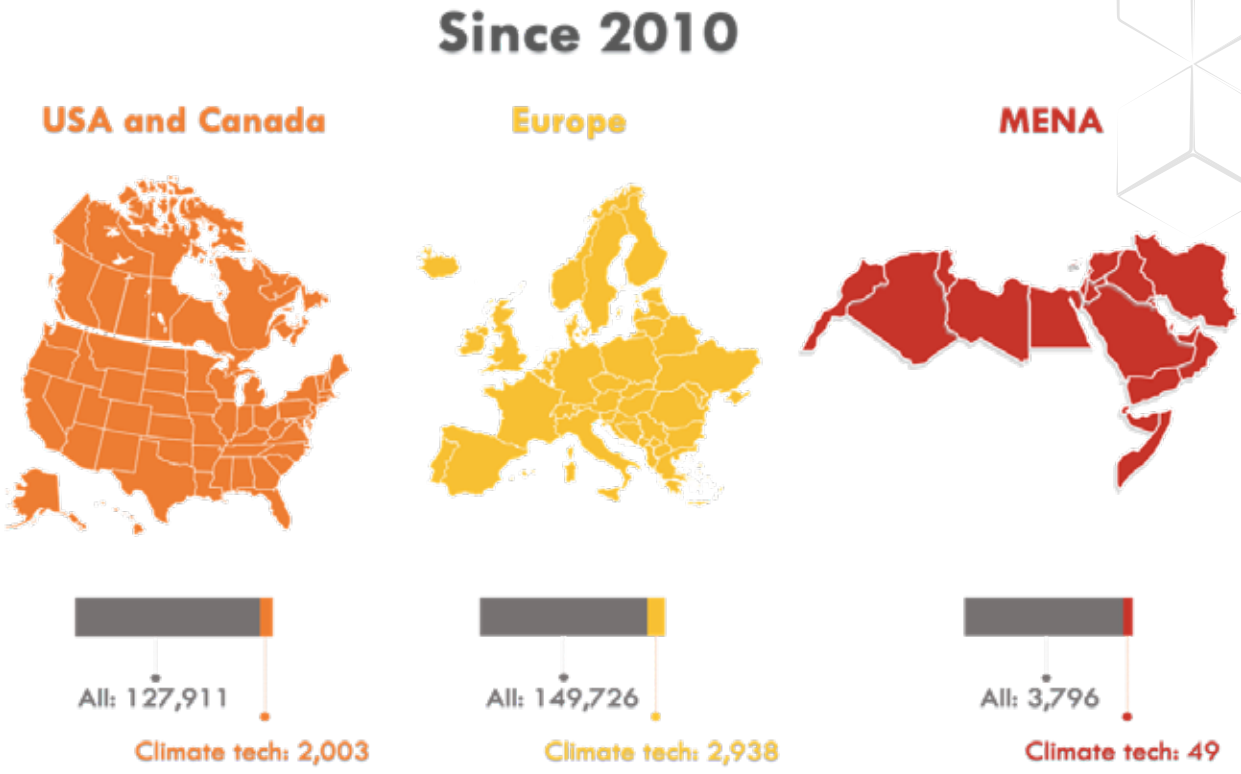


Figure 4: The number of all types of startups and Climate Tech startups established in the USA and Canada, Europe, and MENA, since 2010[4]

The limited number of investable opportunities in the Climate Tech sector is one of the reasons for the lack of abundant investment in the region. Since 2010, 49 new Climate Tech startups have been founded in the MENA region, compared to 2,938 in Europe and 2,003 in the US and Canada. The MENA region has the lowest ratio of Climate Tech startups to all startups amongst the three regions examined in this paper (Figure 4).

Climate Tech startups received minimal funding, especially when compared to fintech, which is the most funded investment sector in the region.

While the number of investments in MENA's FinTech startups grew steadily, by almost 6 times, the Climate Tech startups had a fairly irregular funding pattern. The number of deals in Climate Tech startups increased, especially in 2019 and 2020, due to the funding rounds of AgriTech companies such as Bekia and PlantOS.

[4] CEBC analysis on dealroom.co data. Note: The dealroom.co data may be not fully representative of the MENA market, CEBC shall not be liable for errors that may be contained herein.

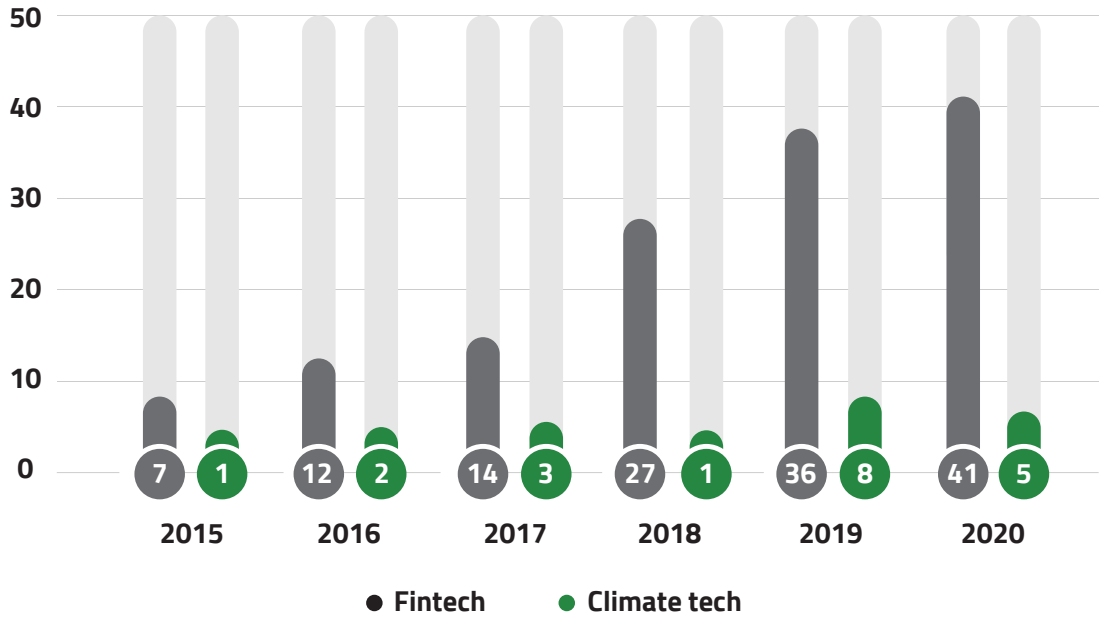


Figure 5: Funding activity comparison between fintech and climate tech startups, between 2015 and 2020[5]

> "The MENA region has shown leadership and a pioneering spirit but much more can be done. Although there have been significant developments in the MENA's startup ecosystem over the past few years, there are very few ClimateTech startups compared to the potential of the region."
>
> Cornelius Matthes, CEO of Dii Desert Energy

[5] CEBC analysis on dealroom.co data. Note: The dealroom.co data may be not fully representative of the MENA market, CEBC shall not be liable for errors that may be contained herein.

CHALLENGES OF CLIMATE TECH STARTUP ECOSYSTEM IN MENA

In conducting interviews with different actors in the MENA region's Climate Tech startup ecosystem (e.g., startups, VC firms, angel investors), a number of key issues are cited for impeding abundant VC investment in Climate Tech startups.

The MENA's ClimateTech startup ecosystem is comprised of different actors ranging from public to private sector such as corporations, incubators/accelerators, investors, etc.

This section will examine the interaction between the most significant players in the ecosystem (governments, startups, venture capital firms) and will discuss some of the challenges that halt the expansion of the ecosystem. Different players' actions and/or challenges have effects on other players. First, this section will identify the challenges and barriers that different players face. Then, it will examine the interactions between them.

The Impact of Governments

It goes without saying that governments are crucial in the overall functioning of every system, and the Climate Tech startup ecosystem is no exception. Public policy has an influence on entrepreneurial activity, and public sector involvement can bridge the financing gap that most startups are suffering from. However, some government policies may hinder the development of Climate Tech startups, which limits both the number of Climate Tech startups that would be established in the future and the volume of VC investment.

1. **Regulation and policy barriers:** The structure and the system of the energy market in MENA countries does not necessarily allow for entrepreneurs to explore and exploit new opportunities. In Western economies, deregulation of the energy sector in recent years has resulted in the privatisation of production and distribution. This in turn, has allowed for a more competitive environment to emerge, where different utilities can participate in these activities and boost innovation. In the MENA region, although generation does have some private sector involvement through IPPs, it is still limited. This creates a quasi-monopolistic structure in the market. Nevertheless, especially in the UAE, certain changes and reforms have been introduced recently. Shams Dubai was implemented in early 2015 by the Dubai Electricity & Water Authority (DEWA). It is a smart initiative to connect solar energy to buildings, supporting diversifying the energy mix and a part of the Distributed Renewable Resources Generation programme. The initiative encourages households and building owners to install PV panels to generate electricity and connect them to DEWA's grid. Although Shams Dubai is a step in the right direction, more work needs to be done. However, there is a strong push for technological change, as the cost of renewable energy technology has become much more economical, and energy storage is now cost-competitive; thus, electric vehicles (EVs) are becoming more widely adopted.

> "There is not enough opportunity for entrepreneurs to solve problems by setting up companies. This creates a chicken and egg problem. The climate tech startup ecosystem requires both ends functioning. Once the environment is more conducive for more climate tech startups to be established, it will give rise to opportunity, more investment and mentorship."
>
> Hassan Ebrahim - VP of Finance at Yellow Door Energy

2. **Complex administration:** In the MENA region, the costs of starting a small-to medium-size limited liability company are substantially high and the procedures are cumbersome; this not only affects the establishment of Climate Tech startups in the region, but all new businesses altogether. Nevertheless, we still believe that it plays an important role in the overall development of the startup ecosystem in the region. Rita Ramalho, the Senior Manager for the World Bank's Global Indicators Group, states that "government awareness of the needs of entrepreneurs is of utmost importance to a country's business landscape". Countries like Kenya and Saudi Arabia have made deliberate efforts to stimulate growth by removing unnecessary obstacles, e.g., including prohibitive costs that may hinder the emergence of startups.

3. **Complexity from local considerations:** The MENA region is highly heterogeneous and local market considerations present specific barriers to investment, especially since investment confidence generally follows geo-political stability and macroeconomic risk. As the region has a relatively large number of smaller economies there is a splintering in the size of potential investment opportunities and markets. If each country maintains its own local regulatory and legal regime and creates cross-border barriers to companies, this will frustrate the efforts of firms to create scale and expand.

4. **Insufficient kick-starter investment:** There are several public and private programs that assist startups in the MENA region. Most of these programs are in the UAE (Dubai, Sharjah, Abu Dhabi), Saudi Arabia, and Egypt. Examples include the DIFC FinTech Hive (UAE)[6], Monsha'at (KSA)[7], MISA (KSA)[8] , and TIEC (Egypt)[9] . However, the rest of the region lacks these initiatives and even the programs in the UAE, KSA, and Egypt are not well-tailored to the specific needs of the Climate Tech startups. Apart from the funds that can be allocated during these incubator/accelerator programs, there are no specific funds to support innovation in the Climate Tech sphere, as seen in Europe. Ideally, specific funds should be allocated to encourage the establishment of Climate Tech startups, both at the municipality level and national level.

6 DIFC FinTech Hive is a scale-up accelerator program designed to attract FinTech startups and support them with establishing strategic partnerships with banks & regulators in Dubai International Financial Centre.

7 The General Authority for SME "Monsha'at" organizes, supports and sponsors the SME sector, to increase the productivity of SME and their contribution to the GDP from 20% to 35% by 2030. For international startups it offers funding, and an opportunity to scale.

The Impact of Venture Capital Firms

There are also some barriers from the VC firms' side that hinder and slow down investments in the Climate Tech sector in the MENA region, such as:

1. **Nascent Venture Capital industry and culture**: In the MENA region, despite the growth trend, the venture capital industry is still nascent. Both Europe and the US, have well-established institutions at both the national and regional levels (e.g., Invest Europe (EVPA)[10], National Venture Capital Association (NCVA)[11] , etc.) which organize VC activities. An important step to develop the VC industry in the MENA region was taken through the establishment of the Middle East Venture Capital Association (MEVCA)[12] which provides an industry body to the Middle Eastern VC Community.

   As there is still not a deeply embedded VC culture in the region, most of the VC capital flows into the sectors that VC firms traditionally invest in sectors such as FinTech and e-commerce. Therefore, the examples of specialized funds and incubators/accelerators for Climate Tech startups is non-existent in the region; while in the US and Europe we can see many examples of them as mentioned in previous sections (e.g., EU Climate-KIC, Amazon Climate Pledge Fund, etc.).

> "Everyone is aware that we are experiencing a global surge in ESG-themed investments. The Pandemic can be a catalyst towards this view. A younger generation of people are getting into positions of leadership, making investments and this is also driving part of this new trend. We are seeing the effects of this in the region. More sophisticated investors are looking at investment more holistically, in terms of return, and also ESG metrics. Investment in climate tech startups will continue to grow and expand thanks to this."
>
> Hassan Ebrahim - VP of Finance at Yellow Door Energy

Another consequence of the nascent VC ecosystem in the region is that there is a lack of necessary amounts of institutional growth capital. Most funds operating in the MENA region focus on early-stage and Series-A funding rounds, which limits Climate Tech startups in raising capital to eventually exit. Moreover, this is an issue because it leaves ClimateTech startups with fewer options in obtaining a larger investment size e.g., family offices, corporates, government institutions, or international investors. These issues hinder the growth of ClimateTech startups in the region, and limit the capital deployed into the ecosystem.

8 The Ministry of Investment of Saudi Arabia (MISA) is responsible for stimulation of local investments. For any company looking to set up in KSA, MISA provides the license to incorporate and be able to operate in the Kingdom.

9 TIEC is the government accelerator and incubator, attached to the Ministry of Communication, Information and Technology. TIEC bolsters R&D in the local ICT industry, observes iClusters, funds startups, and promotes Egypt as offshoring destination.

10 Invest Europe, formerly known as the European Private Equity and Venture Capital Association (EVPA) is the pre-eminent association representing Europe's private equity, venture capital, and infrastructure sectors.
11 The National Venture Capital Association (NVCA) is the voice of the US venture capital and startup community. NCVA advocates for public policy that supports the American entrepreneurial ecosystem.

2 **Lack of awareness:** Sustainability is often regarded as a 'luxury' and as a problem of the state, that is not in line with private sector interests. This raises the question of how sustainability can become normalised in investment. Arguably, in the Western world, the idea that sustainability requires a financial sacrifice has been rejected in favour of a view that sustainable investment is not only the right thing to do ethically, but also as the most profitable route. This is not something that can be delegated to the state if we are to succeed in reaching the goals of the Paris Agreement.

3 **Unrealistic expectations from VCs:** Traditional VC funds look for a 'home run' investment with very high returns and a smooth exit, this is exemplified by the VC fund's preference for Fintech over Climate Tech. Climate Tech is portrayed as a less interesting, less innovative, and consequently a less valuable endeavour. Therefore, while the risk/reward profile of Climate Tech investments might be satisfactory in economic terms, it seems to not match the preferred criteria of the firms that participated in this research paper. Another key finding of this paper is that firms tend to want the technology of Clean Tech startups to be new and unique before they make an investment. This is an interesting finding because it indicates that a successful investment might be a superior business model rather than a brand-new technology. However, this contradicts some of the findings from the interviews with investors, where they indicated that they needed proof of concept and stability prior to making an investment. This is reinforced by the survey that highlights transport, renewables, and energy efficiency – areas in which the technical solution might simply need to be imported and implemented locally. This business model is unlikely to return the investment (ROI) multiples that firms seem to be seeking. Finally, there is a doubt about the ability to make a clean exit from an investment on a timely basis.

As previously discussed, the Climate Tech startup ecosystem is comprised of different actors and their individual actions may impact the overall development of the landscape. Diagram 1, examines the relationship between the key stakeholders. Governments, for instance, may have a direct or indirect impact on Climate Tech startups and VC firms. Through regulation and policy barriers, they can create high entry barriers for Climate Tech startups (arrow a) which may limit the number of Climate Tech startups. As a result, VC firms have fewer opportunities to invest in (arrow b) which limits the amount of VC investments.

12 The Middle East Venture Capital Association (MEVCA) aims to serve the Middle East's entrepreneurial and investment community through a concerted effort to advance the region's venture capital industry and greater entrepreneurial ecosystem, by raising awareness about venture capital and through educational programs, seminars, and events.

Additionally, governments' insufficient kick-starter investment may limit both the number of Climate Tech startups due to limited access to financing (arrow a) and the amount of VC investment (arrow d). This would lead to the interaction between venture capital firms and climate tech startups be activated as there will be less investable opportunities for VC firms (arrow b) and this results in less investment that eventually hinders the development of Climate Tech startups (arrow c).

Diagram 1: Interactions between key players in the Climate Tech startup ecosystem

SURVEY ANALYSIS

Background

The MENA region is characterized by its heterogeneous structure in terms of regulations, government policies, societies, and economics. Therefore, besides the semi-structured interviews that we conducted; we have decided to collect quantitative data through a survey that we created. The aim of the survey is to understand the barriers and the reasons behind those barriers in different MENA countries.

The survey was conducted on SurveyMonkey, and the information was collected through the Internet using LinkedIn, CEBC's mailing list, and firms registered in Abu Dhabi Global Market (ADGM). The survey responses were collected in the period from April 28 to July 1, 2021. Below is the key information on the survey respondents. In the following parts, findings from this survey will be presented and analyzed.

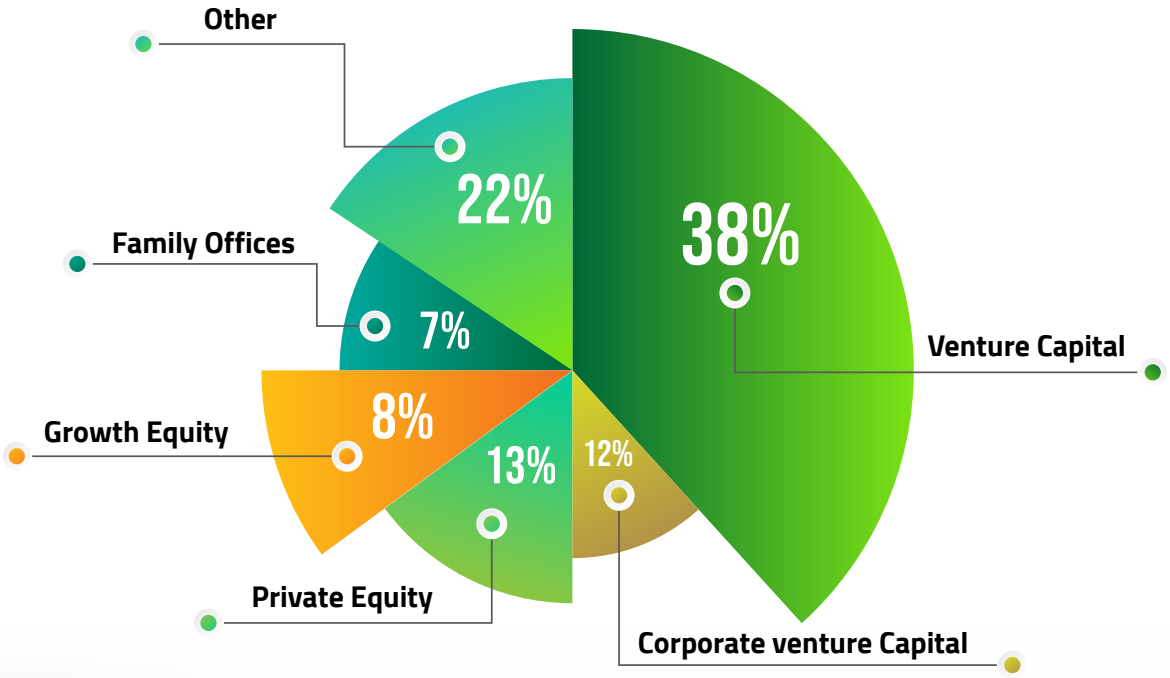


Figure 6: Survey respondents, by sector of activity

- 50% of the respondents to our survey work in Venture Capital (including Corporate Venture Capital), followed by Private Equity (Figure 6).
- Majority of the organizations that participated in the survey have less than 25 employees and 17% of the companies have more than 100 employees.
- 61% of them have been operational for at least 3 years and 50% of them operate outside of the MENA region, with majority having global operations.
- A big portion (35.71%) of the survey respondents' headquarters are in the UAE, followed by Egypt (16.67%), Saudi Arabia, Oman, and Jordan (7.14%).
- 79% of the respondents operate in a MENA country other than their head office (Figure 7).

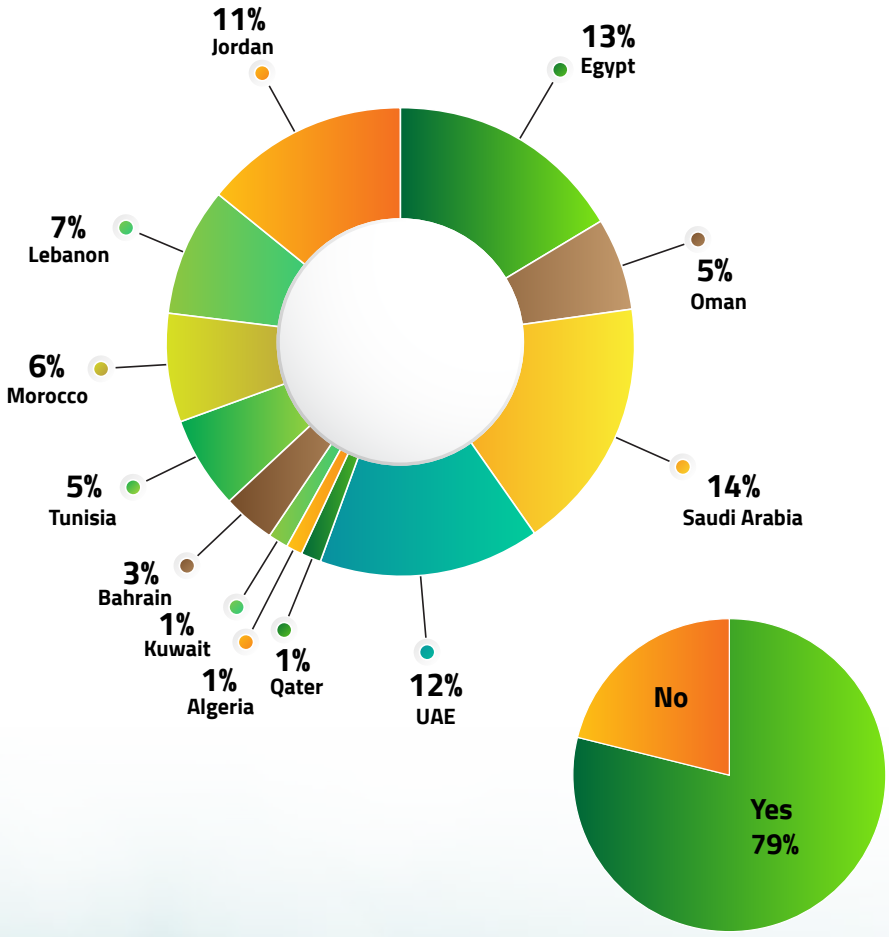


Figure 7: Survey respondents' operations in MENA countries besides HQ

Confidence level in investing in MENA

When investors were asked about their confidence level in investing in the different MENA countries (Figure 8), the level of confidence in investing is positive in all countries except for Lebanon, which has a remarkably low confidence level (-44.13%%) and Morocco (-2.94%). It is also worth noting that the UAE has a very high confidence rate (63.89%) followed by Saudi Arabia (47.2%).

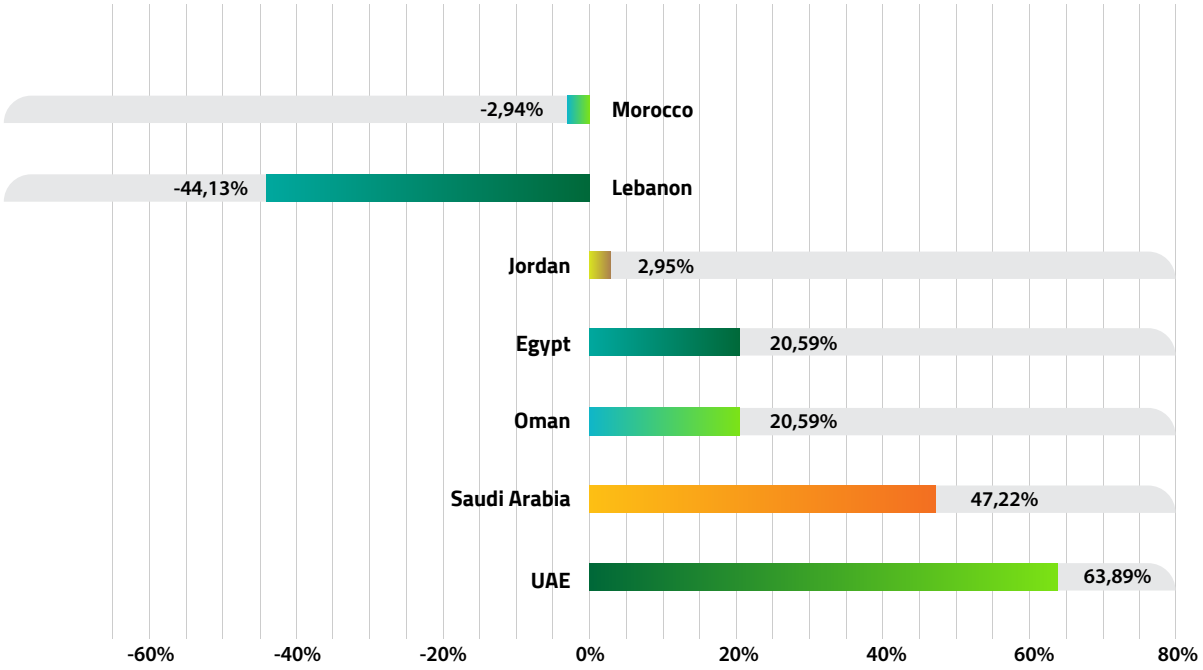


Figure 8: Confidence level in investing in MENA, by country[13]

Confirming the external data, our survey shows that the most popular sectors in the region are FinTech (15%) and e-commerce (12%), followed by sectors such as artificial intelligence and blockchain (11%).

13 The values were calculated by turning the answers to numeric values by giving them the following values: Very Unconfident = -2, Unconfident = -1, Neutral=0, Confident=1, Very Confident=2. Then the average was calculated to be on a scale from –2 to +2 and turned into percentage of confidence/unconfidence.

Figure 9 demonstrates the level of confidence in investing across different sectors per the MENA countries:

- As with the overall confidence level, Lebanon has a noteworthy lack of confidence in every single startup sector.
- Investors in Saudi Arabia were most confident in investing in education, e-commerce, and Fintech, respectively.
- UAE investors display high confidence in investing in all sectors, except for gaming and hard tech.
- It is worth noting that investors in Morocco display high confidence in investing in gaming startups, which is a sector that generally lacks investment confidence in all the other surveyed countries, except Oman.
- The survey data indicates that investors have high confidence when investing in Climate Tech in the KSA, UAE, Oman, Egypt, and Morocco respectively. Alternatively, investors in Jordan and Lebanon display reluctance in investing in Climate Tech.

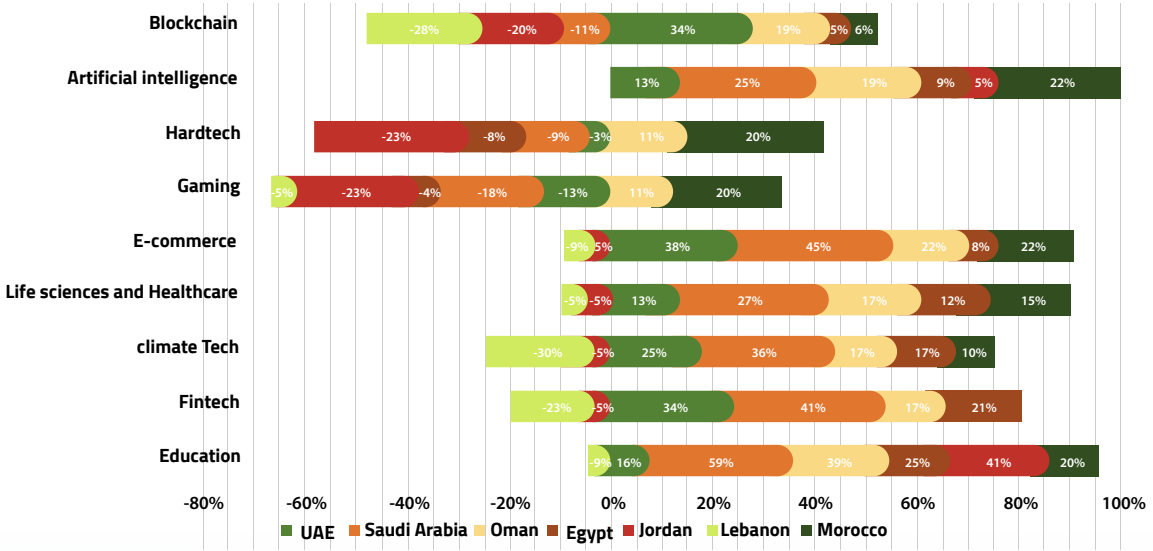


Figure 9: Confidence level in investing in MENA, by sector and country

MENA's high potential in energy and e-mobility

Climate Tech is an umbrella term that includes different sectors such as electric mobility (e-mobility), energy efficiency, GHG capture, and storage, etc. Survey respondents stated that the top 3 Climate Tech sectors with the most potential in the region are clean energy, e-mobility, and energy respectively whereas GHG capture & storage have the least potential (Figure 10).

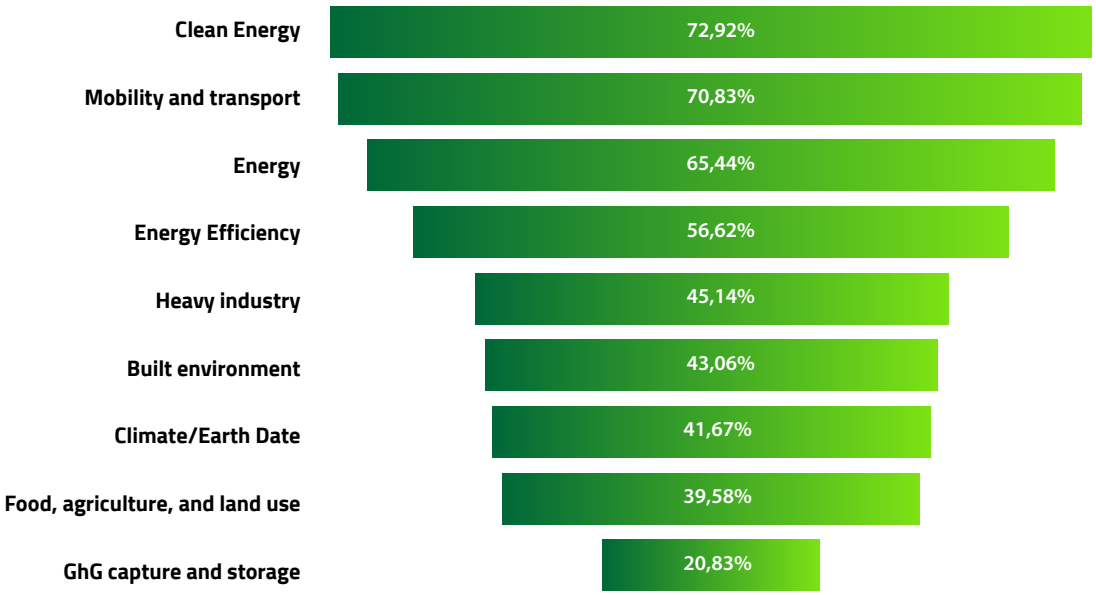


Figure 10: Ranking of the climate tech fields from the most to least potential for the MENA region[14]

Key barriers to a more abundant VC investment in Climate Tech

When the survey respondents were asked about the top reasons for not investing in Climate Tech, the following factors were cited: lack of successful exits (19%), scale problems (18%), low confidence level in the macroeconomy (18%), lack of investable opportunities (17%), lack of regulatory framework (14%), lack of consideration/awareness (9%), and complex bureaucracy (4%) (Figure 11). This corresponds with the qualitative data that the CEBC obtained from the interviews conducted.

14 Note on the calculation method: Each number was given a mark and average was made (9=0/100 potential,8=12.5/100,7=25/100 potential, with 12.5 increments). They were then filtered from highest potential to lowest potential.

Figure 12 illustrates the breakdown of the main barriers to VC investment in Climate Tech across different MENA countries (UAE, KSA, Oman, Egypt, Jordan, Lebanon, Morocco).

- The UAE is the only MENA country where 'lack of regulatory framework' was not one of the main barriers. Hence, if we see more successful Climate Tech startup exits and more evidence to successfully scale in the UAE, the VC climate tech investments can see a significant increase.
- In Lebanon, the most significant barrier to private Climate Tech investment is 'low confidence level in the macroeconomy' (33.3%). The same factor plays an important role in Saudi Arabia (25%) and Jordan (22.3%) as well.
- Lack of investable opportunities, scale problems, and lack of consideration/awareness (to varying extents) are relevant barriers in all countries.
- Complex bureaucracy is a minor factor in 3 MENA countries: Jordan (9.09%), Egypt (8.7%), and Lebanon (5.56%).

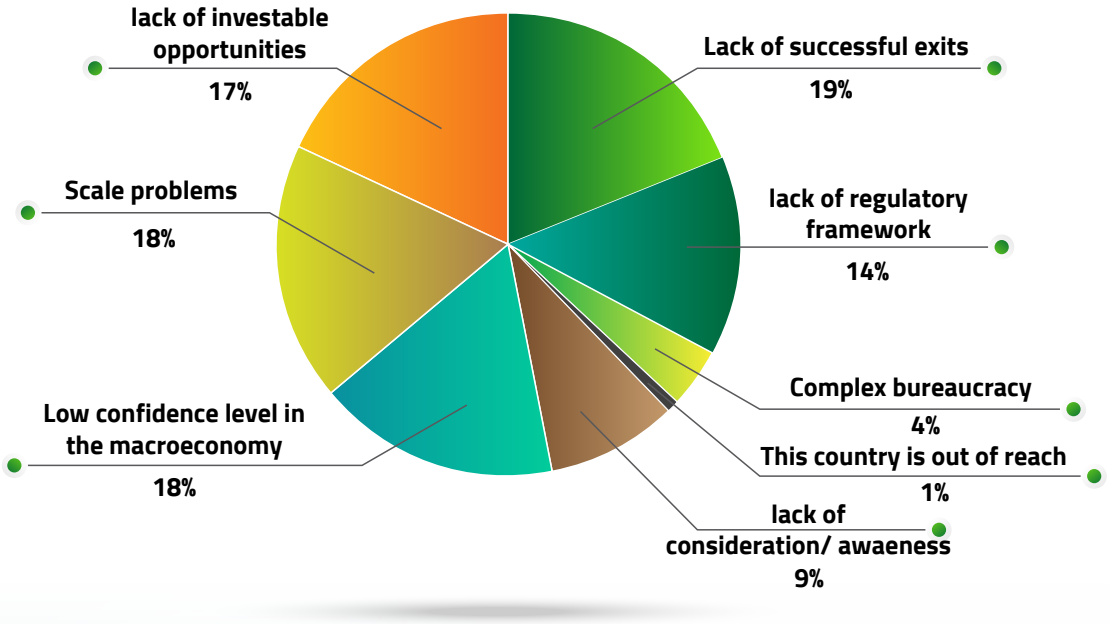


Figure 11: Investors' most likely reasons to not to have investments in climate tech sector

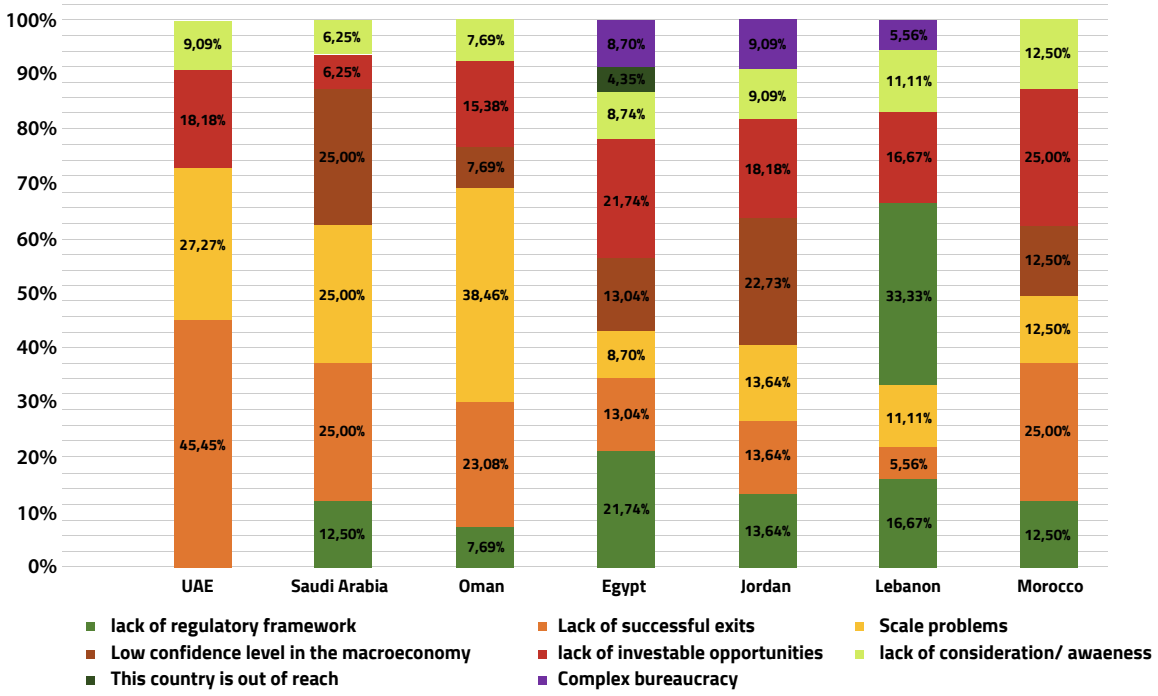


Figure 12: Investors' most likely reasons to not to have investments in ClimateTech sector, by country

The future can be bright for the MENA's Climate Tech startups, under the right solutions

82% of the survey respondents did not have any Climate Tech investments, which proves the lack of widespread Climate Tech investments in the MENA region (Figure 13). However, 94% of the respondents indicated that they would consider investing in MENA's Climate Tech startups in the future (Figure 14). This demonstrates the untapped potential in Climate Tech in the region. Once the key barriers to investment are addressed, the region may become a Climate Tech hub.

There four key themes that investors cited when asked about what needs to change in the MENA region's ClimateTech startup ecosystem, for them to invest in ClimateTech startups. These were: **higher ROIs (30%), global momentum and involvement (30%), clear regulatory framework (20%), and more investable opportunities (20%).**

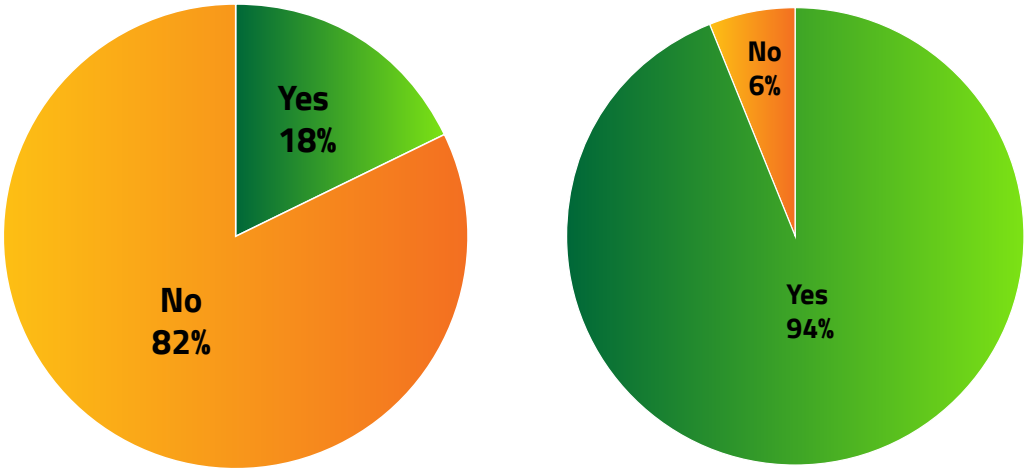


Figure 13: Percentage of survey respondents that have/don't have Climate Tech investments (on the left)

Figure 14: Percentage of survey respondents that would consider/not consider having Climate ech investments in the future (on the right)

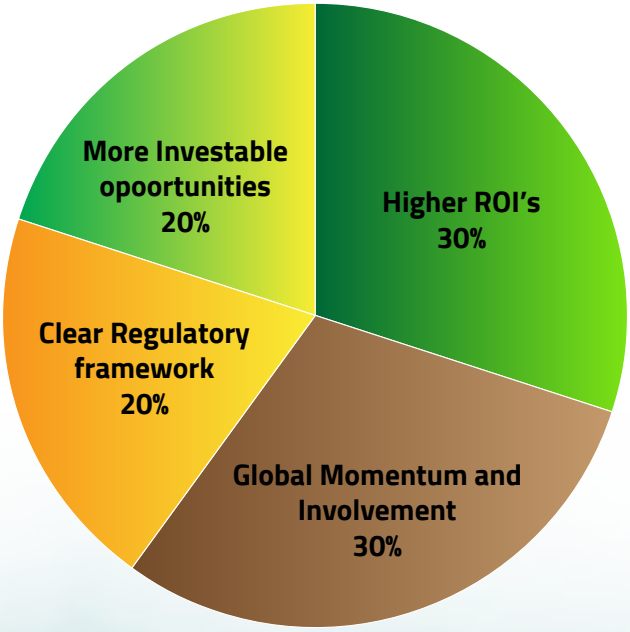


Figure 15: 'What is the single most important change that needs to happen for your firm to start investing/invest more into Climate Tech in the region'

Brief analysis on MENA Climate Tech startups, according to the survey data

27 Climate Tech startups responded to the CEBC's survey. Most of the startups in the sample operate in energy (29%), buildings (26%), and adaptation (13%) (Figure 16). A vast majority of the startups (67%) stated that they did not receive any external funding for their business to date. As for the startups that received external funding, the most common sources of funding were friends & family (36%), venture capital (23%), and government grant/subsidy (16%) (Figure 17).

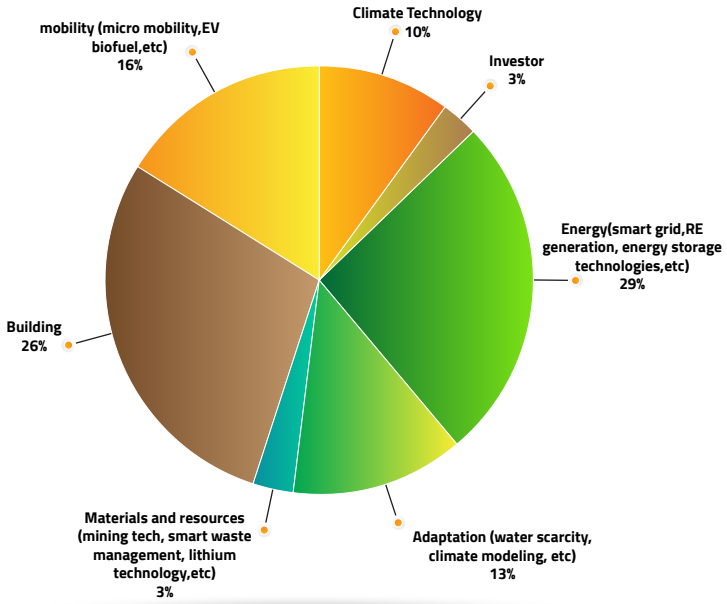


Figure 16: Climate Tech startups' field of activity

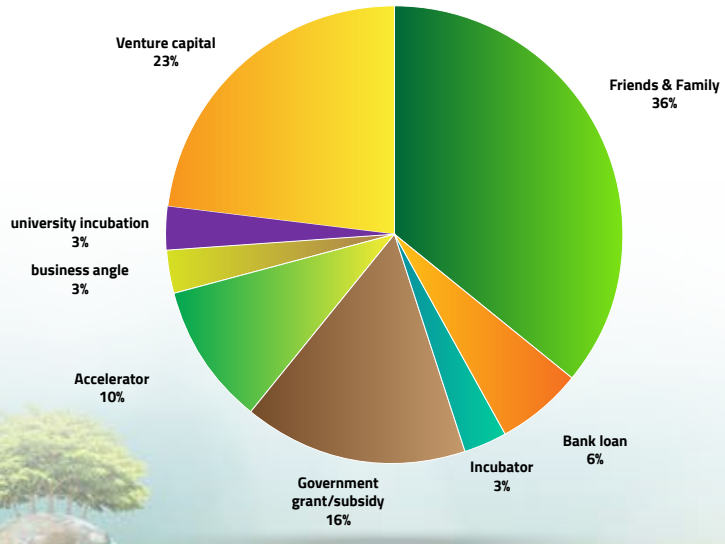


Figure 17: Sources of funding for MENA Climate Tech startups

Recommendations

This research paper has discussed the different factors that hinder abundant private investments in Climate Tech startups in the MENA region. In the MENA region, different actors pose different challenges in the Climate Tech ecosystem, causing both insufficient scaling and funding of startups. Addressing these barriers is important to boost the amount of private capital deployed in Climate Tech startups, and to reach net zero emissions before 2050.

By utilising data from regional investors in Climate Tech startups (China, Europe, North America) and from our data analysis (interviews and survey), we have identified a range of recommendations that can help different stakeholders and enable more abundant venture capital investment in the MENA's Climate Tech startups.

Recommendations for Policymakers

1. **Conduct detailed analysis to define a roadmap:** Solutions that seek to create a more supportive environment for Climate Tech startups, need to include detailed analysis. Therefore, it could be beneficial for the national policymakers to conduct research on the impacts of different strategies for decarbonizing different sectors. This can then be used to determine action areas and build out a roadmap. This analysis can help support governments and other key stakeholders in building out a set of implementation initiatives that focus on different sectors and help build up some of the subnational capabilities and the carbon peaking approaches to cities and organizations. Additionally, regulatory reform in the power sector will allow for the increased adoption of renewables on the grid as well as distributed service models for the tech advantage of energy efficiency.

2. **Build a climate tech ecosystem:** The MENA policymakers can help build a supportive environment through a variety of tools and methods, such as:

   A **Developing the policy framework:** Governments and policymakers have a crucial part in developing a supportive ecosystem for Climate Tech startups as well as investors. Although governments in some cases are sources of support (e.g., the provision of subsidies), the policy framework needs to be developed further, to remove barriers to the establishment of Climate Tech startups and to more abundant private investment. Heterogeneity in the economic structures and regulations amongst the MENA countries may result in a lack of clarity for investors.

Therefore, governments may consider harmonizing cross-border rules or regulatory passports to minimize this problem. The benefits of this arrangement are threefold: it can boost regional trade, help with the overall economic development in the region, help Climate Tech startups to gain more market share, and attract more capital from regional and multinational VC firms. Attracting multinational venture capital firms to the MENA region is crucial, especially given that the investment activities of large VC investors such as Sequoia Capital, Khosla Ventures, Accel Partners are non-existent. Their presence in the region may help the Climate Tech startups to obtain larger ticket sizes, and therefore scale up.

B **Government leadership to encourage investments:** Governments should play a leading role both in terms of stimulating innovation and encouraging VC and PE investors to allocate more of their capital in the Climate Tech sphere. The newly established policy frameworks need to be clear and consistent, to attract financing from venture capital firms, corporate venture capital, and private equity firms. As seen in Europe, the EU Green Deal is a massive initiative covering many areas such as transport, industry, energy, and finance; with an end goal to make Europe the first continent to reach net-zero emissions by 2050. There are specific frameworks and tools that are developed for different industries to make sure that the targets are reached. For instance, the Kingdom of Saudi Arabia has announced an organic farming action plan[15] and allocated $200 million to support it in 2018. Red Sea Farms, a Saudi AgriTech startup that is estimated to be valued between USD 42 – 65 million, is part of this action plan (see Annex A). Other countries in the region can benefit from implementing such policies as well.

> "The UAE could propose a green recovery program, similar to the European Green Deal, and this would be a huge opportunity to accelerate the energy transition."
>
> **Cornelius Matthes, CEO of Dii Desert Energy**

Policymakers can also accelerate the creation of an ecosystem to encourage the establishment of start-ups. Horizon 2020[16] , the world's largest research and innovation programme, can potentially be an example that the leaders in the MENA region can emulate. A top-down approach through implementing such programs can be of great benefit to the start-up ecosystem as it can boost investor confidence.

15 The aim of the Saudi organic farming action plan is to increase organic production by 300 percent, as well as providing safe food, and sustainable, highly profitable farming.
16 Horizon 2020 is the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness. By coupling research and innovation, Horizon 2020 is helping to achieve this with its emphasis on excellent science, industrial leadership and tackling societal challenges. The goal is to ensure Europe produces world-class science, removes barriers to innovation and makes it easier for the public and private sectors to work together in delivering innovation.

Stimulus investments in climate technologies can increase job creation and attract investors' attention to this sphere. Governments should utilise their different funding instruments and become more involved in the earlier stage and riskier projects to support Climate Tech startups. These systematic investments can enable Climate Tech startups to gain more credibility from local and international venture capital firms.

To make these investments as effective as possible, ESG should be at the core of the policy development process, not an afterthought. A government investment arm with a specific investment structure can be created for Climate Tech startups (e.g., 5- year lock up on dedicated Climate Tech investments in return for a negative tax rate).

Moreover, the efforts at the national level can be strengthened by the efforts at the city level as well. Local governmental structures can also define their own plans to tackle climate change and be in charge of the implementation of these plans. Working at the city level can help promote more innovation as the directives do not take only take a top-down approach but a bottom-up approach as well. Piloting and demonstrating projects to test their feasibility and to be able to scale new technologies across cities.

C **Establish public private partnerships (PPP):** It is important for all stakeholders, e.g., governments, state-owned enterprises, and the private sector to come together to support and make sure that ambitious policies can be implemented. For instance, government and NGO partnerships can extend innovations and support the current landscape through various technical and economic studies, working with other partners and bringing in international expertise. This could be beneficial for the MENA region in its transition to a low-carbon economy.

D **Governments should support R&D work:** The MENA governments can allocate a budget for research institutions that is specifically for the pursuit of R&D for Clean Tech solutions. Also, the companies should be allowed to do pilot projects within the government facilities or infrastructure if needed. Governments can also provide R&D grants to startups. This would allow more innovation and creation of more startups working in climate technologies.

E **Build more accelerator/incubator programmes specialized for Climate Tech startups:** Governments can help the Climate Tech entrepreneurial ecosystem by establishing more accelerator/incubator programmes. Not many examples of Climate Tech specialized accelerator/incubator programmes in the region can be found. However, one recent example gives hope for the future - Nahdet El Mahrousa[17] in partnership with Cleantech Arabia[18] and Hivos[19] formed an alliance.

17 Nahdet El Mahrousa (NM) is an Egyptian not-for-profit, non-governmental organization (NPO/NGO) that builds the capacities of organizations to improve and expand their social impact.

18 Cleantech Arabia (CTA) is a non-profit organization with a mission to advance job creation, local economic development, and environmental protection in the Arab World. Cleantech Arabia designed its mechanisms along cluster development methodologies; it supports clean tech startups and MSEs, the surrounding ecosystem of supporting entities and service providers, as well as markets at large.

19 Hivos was founded in 1968, inspired by humanist values. Hivos' founders held the conviction that development work should be secular, as true cooperation presumes respect for differing beliefs.

Under the growth acceleration round from the Green Works program, they aim to enable the growth of green enterprises creating significant social impact in Egypt. While this is an important effort, many more specialized programmes in the region are needed. Please refer to Annex B to find some examples of the Green Startup programmes in the MENA region. Different accelerator/incubator programmes (as a subsection of Climate Tech) can serve different purposes to meet specific needs in different regions. The establishment of these programmes would help with creating a Climate Tech hub in the region, which in turn would attract more investors.

Recommendations for Venture Capitalists

1. **Be aware of the opportunities:** The venture capitalists in the region need to be more aware of the unique opportunities that the Climate Tech startups represent and the solutions that they bring to the world's most pressing problems. They need to be cognizant of the strategic opportunities that Climate Tech offers, especially in the Covid-19 recovery period and approaching the deadline of the Paris Agreement. Refer to Annex A for some of the startups providing important solutions to tackle climate change.

2. **Consider establishing dedicated Climate Tech venture funds:** Due to the nascent nature of the VC culture in the region, it may be challenging to establish dedicated Climate Tech venture funds; however, it is of crucial importance to develop the ecosystem. The establishment of these specialist funds can also solve another problem in the region, which is the lack of LPs from family offices, pension funds as it can offer a strategic positioning for venture capitalists. This, in turn, would create a positive feedback loop between increasing credibility of VCs, hence more LP base for funds and more industry specific knowledge. It would not only be beneficial for Climate Tech startups, but also would develop the whole startup ecosystem.

3. **Increased engagement from the Corporate Venture Capitalists:** In addition to the individual venture capital funds, the active participation of corporate venture capitalists is crucial in the development of the Climate Tech ecosystem for numerous reasons: the corporates can provide the Climate Tech startups with the financial means, market access (especially important in industries such as energy and heavy industry where there are high entry barriers), access to R&D facilities' and know-how. The corporations in the region can develop effective and robust models to form mutual relationships with the Climate Tech startups, which would also be beneficial for corporations' non-financial performance. To achieve this, corporations should proactively integrate ESG into their corporate innovation strategy.

Note on the calculation method: Each number was given a mark and average was made (9=0/100 potential,8=12.5/100,7=25/100 potential, with 12.5 increments). They were then filtered from highest potential to lowest potential.

Recommendations for Universities

Although universities do not have a direct impact on the investment cycle of the Climate Tech startups, our research has shown that the universities have a significant impact, albeit indirect, on the future functioning of the climate tech startup ecosystem, as they are raising generations and an important part of R&D takes place within university facilities.

1. **Offer courses on climate change and sustainable development:** One of the fundamental barriers that Climate Tech startups are facing is the limited climate change, and Climate Tech awareness in the region. While offering courses on climate change and sustainability as part of every university programme would increase overall awareness on environmental issues, adding specific practical modules in engineering fields might have more immediate effects. Furthermore, finance programmes can incorporate courses such as sustainable finance with specific modules on infrastructure financing more widely.

2. **Build ClimateTech innovation hubs within the university:** universities can create innovation hubs to foster a more entrepreneurial spirit, industrializing nascent innovations and making long-established activities agile. This will make students discover entrepreneurship very early on and get inspired. Universities can also form partnerships with VC firms and CVCs to attract more funding for Climate Tech startups and bring in expertise. By forming its own dedicated incubator/accelerator programmes, universities can also create and allocate university funding for Climate Tech startups. Finally, university innovation hubs should give access to R&D facilities within the university to boost more innovation.

Conclusion

Globally, there has been a surge in the Climate Tech investment over the past years which has been coined as 'Cleantech 2.0'. However, research suggests that this time around there is solid reasons to back up the claims behind the growth and that it will be maintained in the future. We can state some of the factors as having stronger institutional support and policy tools, demand from the consumer side, better-established infrastructure to support technology, more cost-competitive technology, and a new generation of climate-aware investors. However, despite the investment growth on the global level, the MENA Climate Tech startups' share in the world remains fairly limited. Besides, in CleanTech Group's 2020 report, no MENA startups were featured on the list of Clean Tech startups that are most likely to make a significant market impact in the future.

The MENA region is highly vulnerable to climate change and if immediate action is not taken, by 2050, the region will have difficulties in terms of sustaining its energy, water, and agriculture sectors and meeting demands. One of the opportunities for MENA in the way of fighting against climate is developing its Climate Tech startup ecosystem. However, despite the upwards trend in the rest of the world (especially in the US, China and Europe), the fact that the Climate Tech startup ecosystem in MENA is not well developed and lacks funding from private investors, contradicts with the region's reality as in theory MENA's vulnerability to climate change should make it a solution hub and developing the climate technologies and commercializing them is an effective way of reaching net-zero targets before 2050.

The climate tech landscape in the region is formed by actors that are interconnected and these actors influence each other in a direct or indirect way. This interconnectedness has significant impacts in the overall functioning and development of the ecosystem as a barrier that one actor puts can drag all ecosystem in a vicious circle. For instance, if the policymakers put high entry barriers for the establishment of Climate Tech startups through complex regulation, there will be less innovation and therefore the venture capital investment would be limited due to the lack of investable opportunities.

Although the region currently lags in terms of the amount of venture capital investment in Climate Tech, it still has a lot of potential to become a Climate Tech hub if the barriers in front of the development of the landscape can be effectively addressed. Every actor needs to do their part and there needs be more collaboration from stakeholders to implement the best solutions that unlock the region's potential.

ANNEXES

ANNEX A: Green MENA Startup Examples

Yellow Door Energy is the leading sustainable energy partner for businesses, serving commercial and industrial customers in the Middle East and South Asia. The company's solar and energy efficiency solutions enable businesses to reduce energy costs, improve power reliability and lower carbon emissions.

To-date, Yellow Door Energy has over 200 megawatts of awarded solar projects in the region. Its customers include Nestlé, Unilever, Carrefour/Majid Al Futtaim, Landmark Group and many more. The company's prestigious shareholders include the International Finance Corporation (IFC), Mitsui & Co., Ltd., Equinor, and APICORP.

Founded in 2012 and headquartered in Dubai, Enerwhere is a leading distributed solar utility company in the Middle East and Africa. The company provides power to commercial and industrial clients that don't have a permanent grid connection – construction, mining, quarries, oil and gas, hospitality. Enerwhere has a large project pipeline extending across the UAE, Oman, Nigeria, and numerous countries in Africa. The company offers a diverse set of technological solutions for its customers: hybrid power solutions, solar rooftop systems, storage systems, and microgrid software suite.

Enerwhere is mostly privately funded. In the first years of its establishment, Enerwhere has raised capital from mainly angel investors. In 2015, Enerwhere has raised $10 million in funding from Adenium Energy Capital – a proprietary investment firm specializing in clean and alternative energy. Until 2018, the company has raised money through debt financing. Two crowdfunding rounds on Eureeca – the first multi-regulated global Equity Crowdfunding platform, took place in 2018 and 2019 and Enerwhere raised a total amount of $940 thousand. Over 80% of the funding came from GCC-based individuals and entities, proving the increased interest of local investors in renewable energies.

Advanced Third Age Renewable Energy Company (ATAREC) is a Moroccan startup that enables its users to reduce their environmental footprint and energy bills through its innovative renewable energy solutions.

ATAREC is distinguished by its flagship patented solution WAVE BEAT, which upgrade infrastructure role, from only breaking waves to mining continuousness green energy, with low overcrowding. It has the particularity of capturing directly, through a free float, the sea level variation due to waves. It benefits from onshore advantages while being almost offshore thanks to its location on infrastructures exposed to the sea. More than 70% of its investment is already paid by the asset owner, making WAVE BEAT 60% more competitive than any other wave energy solution in the world. WAVE BEAT is the first Moroccan Platform of wave energy located in Tanger Med Port. Preliminary studies are ongoing for several locations in Africa, Europe and Asia.

The scalability of our ATARAC will benefit from:

- the exceptional performance of WAVE BEAT proved both in Mediterranean and Atlantic Sea.
- Its suitability to be coupled with desalination and green hydrogen electrolysers;
- the notoriety and networking of our two incubators/Host, the two African leaders in their field (Port and phosphate derivatives) :
- Tanger Med is the 1st Port in Africa and in the Mediterranean, and the 2nd leading global free zone in the world (Financial times)
- OCP is the biggest Moroccan public company and the first phosphate and derivatives exporter in the world

Eco-dôme Maroc is a company of ecological construction of houses and infrastructure for the development of rural communities by exploiting local resources, especially the natural earth.

The materials used ensure acoustic (soundproofing) and thermal insulation. The housing's construction is up to two times faster than that of a conventional house. The mixture used in the bags is 90% earth and 10 % cement. This composition allows the structure to have a certain stability. Moreover, the Eco-dômes are also resistant to earthquakes.

Source: Morocco World News

Red Sea Farms is a KSA-based agritech startup that uses saltwater to grow crops. The startup's growing technologies can be swiftly expandd in regions where traditional agriculture methods aren't feasible or cost-effective. The startup's first use of its technology is to grow and sell tomatoes in KSA, however, it aims to have a presence in the global market.

Until now, Red Sea Farms has raised $11.9 million: In 2019, KAUST Innovation Fund and the Saudi-based Research Products Development Company have invested $1.9 million and in 2021, Wa'ed (Saudi Aramco's entrepreneurship arm), Future Investment Initiative Institute (non-profit), KAUST, Global Ventures led a $10 million funding round.

Source: Arab News

ANNEX B: Green Startup Programme Examples – MENA Region

Name: ChangeLabs
Country: Egypt
Name of the Programme:
Scale up to Green

The program was launched in partnership with the Green for Growth Fund (GGF), which is a Euro 600m+ investment fund, supported by the European Union under its EU4Energy initiative. The fund channels financing toward initiatives that expand renewable energy, increase energy efficiency, and reduce the use of natural resources.

Website: https://changelabsme.org/programs/

Name: Flat6Labs
Country: Tunisia
Name of the Programme:
GreenWorks Programme

Supported by Hivos and by the IFC, Impact Partner and Flat6Labs have launched the Green Works initiative to develop economic empowerment of North African youth in the green economies, with a focus on Tunisia.

Impact Partner and Flat6Labs bring complementary support to entrepreneurs in Tunisia. While Impact Partner focuses on personal development, Flat6Labs supports startups by accelerating their entry to relevant markets.

Website: https://flat6labs.com/program/greenworks-program/

Name: ENI CBC Med
Country: Egypt
Name of the Programme:
GIMED Egypt Green Innovation

GIMED supports entrepreneurs who have eco-friendly innovative ideas, products, or services to access finance, compete in the market and grow. The four most innovative ideas and startups will be recognized as a Green Innovation Pioneer and will benefit from a 7500 Euro grant.

Website: https://gimedegypt.com/

Name: Athar
Country: Egypt
Name of the Programme:
Athar Green

Athar Green is a 4 month acceleration program for green startups in Upper Egypt. Program fund is EGP20,000 for each startup

Website: https://www.athareg.com/athar-green/

Name: cewas
Country: Egypt
Name of the Programme:
Green Accelerator Middle East

cewas has implemented tailored programs from ideation to scaling. In all these areas, cewas has strong partners and networks to leverage strategic collaborations, resources and innovation to improve further ecosystem conditions. Setting up the Green Accelerator Middle East in collaboration with sector and investment partners is a key step to better bridge the gap between green enterprises and early-stage investors and accelerate growth and impact-potential through a combination of direct advisory support and catalytic capital.

Website: https://ga-me.creation.camp/programme/

Name:Masdar
Country: United Arab Emirates
Name of the Programme:
The Catalyst

The Catalyst is the region's first clean technology startup accelerator based in Masdar City. Supported by Masdar and energy giant BP, The Catalyst will help startups accelerate their business through funding, training and mentorship. Based in Masdar City Free Zone, The Catalyst targets eco-friendly business ideas that are 1-3 years away from commercialization, and accelerates them through a holistic program, which provides entrepreneurs a range of services and support needed to run a business.

Website: https://catalyst.ae/

Name: Village Capital
Country: United Arab Emirates
Name of the Programme:
SUSTAINABILITY MENA

Village Capital, with the support of International Finance Corporation (IFC), is launching an investment readiness program for Middle East and North Africa (MENA) and Turkey-based startups that are tackling the region's most pressing sustainability challenges.

Website:
https://vilcap.com/current-programs/sustainability-mena

Name: Veolia Middle East
Country:
Name of the Programme:
SPARK

Veolia has set its crosshairs on the Middle East with a new acceleration and mentorship programme that seeks the region's most innovative startups and SMEs tackling sustainability and climate change.

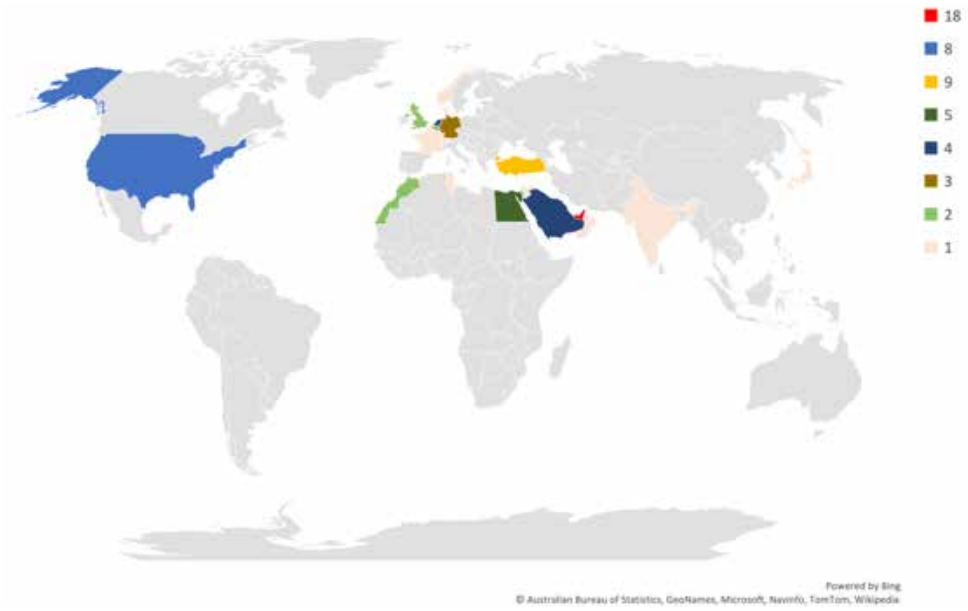
Focusing specifically on startups that can develop a more efficient recycling culture and disrupting waste collection, the programme will offer selected startups mentorship through Veolia network of experts, as well as access to the company's labs and tools, with a monthly allowance of $1,000 given to startups that reach the acceleration stage.

Website: https://www.veolia.com/middleeast/spark-accelerator

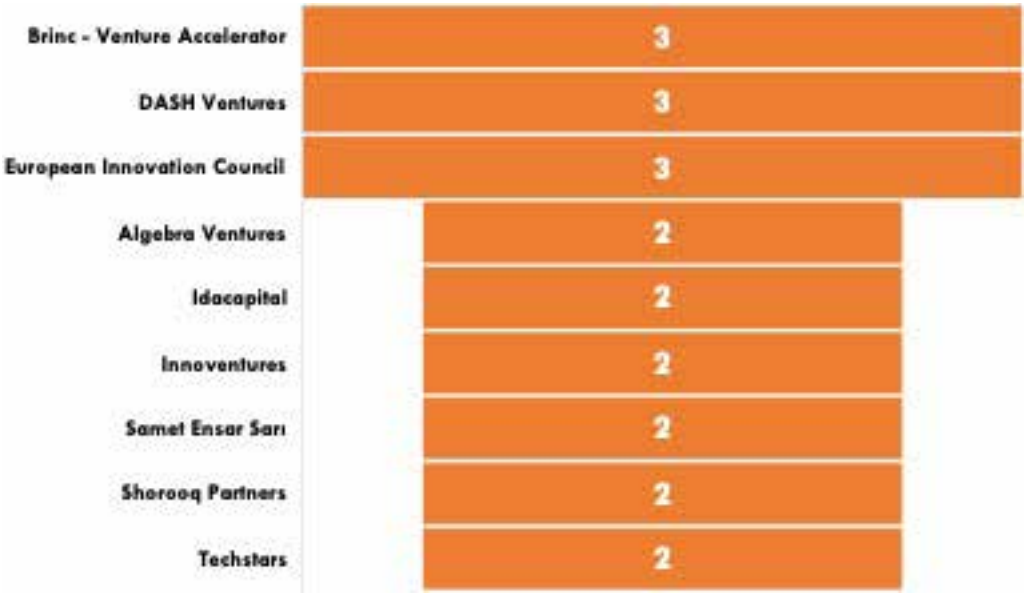
ANNEX C: Climate Tech Startup Investor Analysis on Sample Data

CEBC has conducted an analysis on the climate tech startup investors in the region using dealroom.co database in order to shed more light into the characteristics of the investors based on the sample data that is comprised of 42 climate tech startups.

Climate Tech Investors' HQs



The investors who have participated in MENA's climate tech startups are based in different countries all over the world. However, it is noteworthy to remark that after the United Arab Emirates, Turkey participated the most frequently in the funding rounds of MENA's climate tech startups. The United States followed Turkey, which is consistent with our survey results. From the MENA region, Egypt and Saudi Arabia participated the most in the funding rounds.



When examined the investors that took part in several funding rounds of climate tech startups in MENA, we do not observe any firm that dominates the ecosystem. The participation of the VC firms are rather homogenously distributed.