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THIRTY TO NET ZERO

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INTERVIEWS & Articles

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SPECIAL REPORT: SUSTAINABLE MOBILITY 2022 IN THE MIDDLE EAST

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Editor's Note

Dear Reader,

This COP27, all global policymakers, and sustainability experts have agreed, is a crucial one, perhaps almost as important as Paris.
When the UAE president, Mohammed bin Zayed Al Nahyan, addressed the world leaders' plenary session in Sharm el-Sheikh, he began by discussing oil and gas supplies from the Emirates. "The UAE is a responsible energy supplier, and we will continue to play that role as we pursue a transition to alternate resources and technologies," he said. "By virtue of our geology, the oil and gas we have in the UAE is among the least carbon-intensive in the world. Nevertheless, we will continue to work towards reducing carbon emissions in the sector."

The UAE has declared its intention to achieve net zero emissions by 2050, although the tiny Gulf nation continues to draw at least 30% of its GDP directly from oil and gas, with much of the remaining amount coming from industries heavily linked to fossil fuel consumption, such as airlines, tourism or construction.

With this in mind, we at T2NZ agreed that our issue would focus on Sustainabile Transport, which according to PWC has the power to unlock US$400 bn.

At a time when the world is experiencing so many challenges, the joys of witnessing the success of a brand like Rolls Royce, can drive us, more than ever. The considerations SAE spotlights when reflecting on the growth and technology around Mobility solutions also bring to the fore certain ideas that are yet to be seen in the region.

I would like to end this letter by thanking the entire team involved in the making of this issue of Thirty To Net Zero, from the people in the office and our external contributors, and, of course, our readers. You are the ultimate reason why we put so many hours of hard work into all we do.
Enjoy Reading

Best Regards

Pallavi Shevade
Editor-in-Chief
Thirty to Net Zero


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ROLLS-ROYCE: FLYING INTO A NEW AND SUSTAINABLE CHAPTER FOR TRAVEL

Rolls-Royce unveiled its Pathway to Net Zero strategy in 2021, which was highlighted at COP26 in Glasgow. The long-term plan's primary objectives are to aid in the aviation industry's decarbonization and to maintain flight advancement. The company is leading the way in developing more fuel-efficient engines like the next-generation UltraFan®, in electrifying flight with vehicles like the Spirit of Innovation all-electric aircraft, in expanding its work with hybrid and hydrogen fuel, and in advocating for Sustainable Aviation Fuels, or SAF.

Elaborating further on the company's future research programmes on hydrogen propulsion technology and its plans to develop fuel-efficient engines (UltraFan), Matheu Parr, Director at Rolls-Royce Electrical said, "Making jet engines more fuel efficient is a key part of our Net Zero strategy, which is why we are constantly pioneering new technologies. We recently entered the final build phase for the world's largest aero-engine demonstrator, UltraFan®, providing a suite of technologies to support sustainable air travel for decades to come. The demonstrator engine, with a fan diameter of 140 inches, is being completed at our facility in Derby, UK, prior to its first run – on 100 percent SAF – later this year. It offers a 25 percent fuel efficiency improvement compared with the first generation of the Trent engine. In the nearer term, there are options to transfer technologies from the UltraFan® development programme to current Trent engines to deliver even greater fuel efficiency and reductions in emissions."

The corporation has also spent substantially on research to learn more about the advantages and disadvantages of hydrogen. It has made two partner announcements recently that are tangible manifestations of this plan. A memorandum of understanding was first announced between Rolls-Royce and the Hyundai Motor Group. By 2025, the partners hope to have completed a demonstration of a hybrid electric-fuel-cell aircraft.

Further, Parr said that together, the strengths of both companies in the aerospace and automotive industries can be strengthened through this relationship. The company have shared goals of becoming market leaders in the field of Advanced Air Mobility (AAM) that are bolstered by their partnership. Rolls-Royce just recently made an announcement about teaming up with EasyJet. Narrow-body aircraft, as well as other types of aircraft, will benefit from this ground-breaking research into hydrogen combustion engine technology.

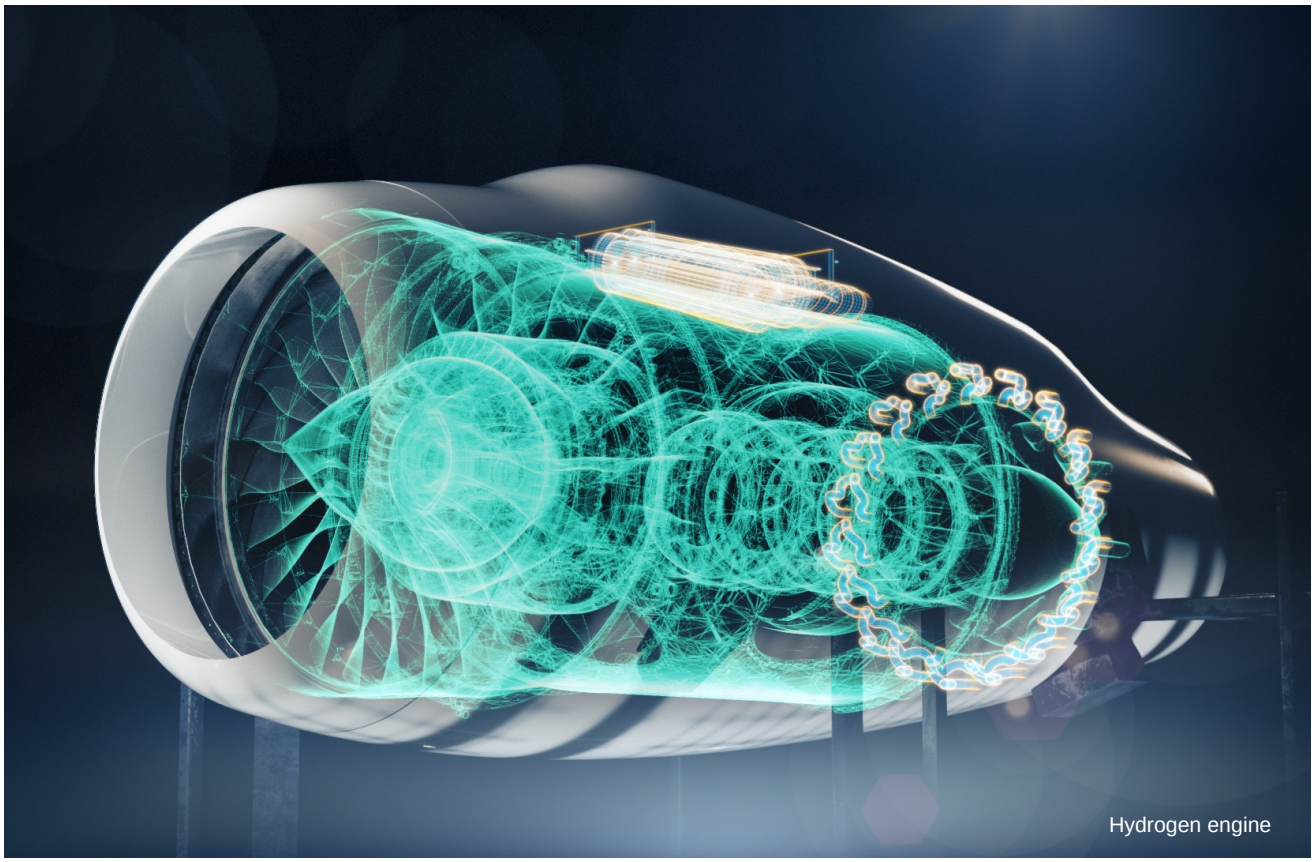
The firms will collaborate to help facilitate a ground test of a Rolls-Royce AE 2100 engine in the UK at an early concept stage. Only a few weeks have passed since the agreement was announced, but now the finishing touches are being put on setting up for the hydrogen ground test. “We have the hydrogen on hand, and our AE 2100 engine is ready to go. We're almost ready to spark, and we can't wait to show you the findings of our test,” said Parr.

Hydro-electric propulsion is expected to be a real game changer in electrification of flight and CO2 reduction in the coming years and many companies are stepping up their research work to align with this new technology. For low-impact, short-distance activities like Urban Air Mobility, battery-powered, all-electric options provide a straightforward option. Hybrid methods that utilise hydrogen fuel cells can be employed to generate electricity for long-range operations, where the battery's weight and efficiency become a problem. Fuel cells allow for scalability in power offerings and enhanced flying range while being a zero-emission, silent, and reliable onboard power source.

Rolls-Royce has an established commitment to knowledge transfer, training and capacity development, across its global operations and business sectors. In the Middle East these have largely been based on Civil Aerospace and Power Systems, where longstanding partnerships have been established, such as in the UAE with Mubadala’s Sanad aviation.

“In terms of where we see ourselves now and, in the future, Rolls-Royce is aiming to become the leading supplier of all-electric and hybrid-electric systems for the Advanced Air Mobility market (AAM). Rolls-Royce Electrical is focused on developing the technology that will power these sustainably focused aircraft. We are now actively working with customers and partners in the Urban Air Mobility (UAM) market. Our electric propulsion unit has been selected by Vertical Aerospace for its all-electric VX4 aircraft, which is aiming for certification in 2025. In the commuter market, we are working with Wideroe, the Norwegian regional airline, which will be the launch customer for the P-Volt, an all-electric powered 9-seat fixed wing Tecnam aircraft ready to enter service in the late-2020s,” stated Parr.

Matheu Parr



Informing further on transition to a sustainable public transportation system in the Middle East economy, Rolls-Royce opined that although the firm cannot make predictions about the auto market, the Middle East's voracious hunger for technology bodes well for the region's future, where it will undoubtedly pave the way for innovative approaches to environmentally friendly public transportation. However, Rolls-Royce has two things going for it that bode well for the company's future.

“First, thanks to data, we've been able to significantly improve the effectiveness of our operations. The computational capacity available to us now allows us to more accurately foresee the outcomes of tests on our engine technology. This implies we can create new engines at a much faster rate because we are not spending as much time on physical testing and remanufacturing. It's also having a dramatic effect on how we go about the physical process of building engines, improving both our capacity for forethought and our ability to keep tabs on how things are progressing,” commented Parr.

Adding further on the topic, Parr stated that additive layer manufacturing (3D printing) is having a revolutionary impact. This is giving Rolls-Royce more leeway in terms of design, which in turn can lead to better product performance and less waste than we would otherwise experience when drilling parts. Our newest business jets, for instance, feature ALM-exclusive cooling slots that improve engine efficiency.

Rolls-Royce and easyJet are set to ground-test their hydrogen combustion engine

Envisioning the world in 2032 from climate-forward transport perspective, Rolls-Royce informed that the company is dedicated to advancing sustainable solutions across all of the markets in which it participates by collaborating with customers, other businesses, government agencies, and other stakeholders. With this comprehensive approach, Rolls-Royce hopes to speed up the technological breakthroughs that could help produce net zero carbon emissions by 2050 and alter the way we travel. This includes the development of all-electric and hybrid-electric aviation propulsion systems. Rolls-Royce isn't just making waves in the aviation industry; the company is also developing game-changing innovations for the maritime and railway industries. Company's hybrid mtu PowerPacks were installed in a hybrid-electric diesel train for passenger and freight service as recently as last year. In addition to lowering emissions by 25%, this can also reduce noise by 75% while operating in electric-only mode.

Further commenting on the recent developments of the company, Matheu Parr stated, "Overall, we see our role as pioneering the power that matters – and that becomes extremely relevant in a future transport landscape where people want to connect sustainably, recognising the fragility of our planet."

Rolls-Royce is also developing new fuels and technologies to assist the maritime shipping industry cut emissions by half by 2050. Hybrid systems, which use batteries to power electric motors and combustion engines or fuel cells to provide drive energy to charge the batteries, are gaining popularity as an example. E-methanol and other environmentally friendly fuels will be vital in keeping the maritime sector running. The methanol engines that the company has been working on will be released in 2026.

Rolls-Royce's next generation UltraFan engine undergoing rigorous testing in the UK

All Photos Provided By Rolls-Royce

People who see challenges differently, see the world differently.

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Building a world that works

THE SAE INTERNATIONAL (SOCIETY OF AUTOMOTIVE ENGINEERS) GLOBAL MISSION: TO ADVANCE SUSTAINABLE MOBILITY KNOWLEDGE AND SOLUTIONS

Dave Colson and Frank Menchaca of SAE International, the preeminent organisation for bringing together and teaching mobility professionals to advance environmentally responsible, equitable, and inclusive transport systems, spoke exclusively to T2NZ about the growth of sustainable mobility in the Middle East region. They shed light on the potential roadmap for writing a new success story in the Middle East region.

SAE is a global association of more than 200,000 engineers and related technical experts in the aerospace, automotive, and commercial vehicle industries. Its core competencies are life-long learning and voluntary consensus standard development. SAE's Automotive Engineering International, Aerospace Engineering, and Off-Highway Engineering magazines, which are known all over the world, keep the transportation industry up to date on the latest innovations.

Speaking about the roads his career has taken, Menchaca says, "The intersection of marketing, transportation, and environment is maybe a little bit unusual. But on the other hand, it's quite natural, because, you know, I came to SAE about seven years ago from the information industry and that really brought me into transportation broadly. And then, as you come into transportation, there are so many unique innovations happening in transportation. You have automation, robotics, and telecommunications moving into the vehicle and over the last several years, you have seen a rising consciousness in the industry that talks about sustainable growth and sustainable development of technology, which has led us into electrification and other forms of sustainable energy. So to me, it's almost like planting the seed of transportation, which sprouted into automation and very naturally grew branches into some sustainability in the environment. Once you're looking at sustainability, you're really looking at the integration of systems like economics, social structure, equity etc. So, transportation connects everything."

Sharing his journey with SAE, Colson added, "My focus is always on the people I know and care about. I should add that I've never worked in the transportation industry before. While I spent several years at FedEx facilitating the shipment of products, I was never actually involved in transportation. To me, it all comes down to this association and this civilization we're constructing. That's the part I love, because the entire globe is concerned about climate change, and we need to figure out how to have an effect on it that will have repercussions for years to come."

With the Middle Eastern countries pushing the 'circular economy' agenda with varying timescales, Menchaca stated, "Every individual has their own unique perspective on how quickly or slowly events unfold. I can assure you, though, that the trend towards greater use of electricity is inevitable. That's not the only green technology out there. On the other hand, that is the one that is happening right now. Therefore, in the United States, the national electric car infrastructure initiative is pushing around $7.5 billion into the state economy, encouraging electrification. There is also legislation in Europe pushing for electrification. But there's a distinct dynamic in the Middle East, as there aren't necessarily any vehicle manufacturers there. Due to its size and organisation, Dubai presents a perfect environment in which to implement electrification across the entire ecosystem. Different paths are being taken, yet everything is happening right now."

A recent PWC analysis found that the GCC governments, in particular, could unlock US$400 billion in socioeconomic value by enabling sustainable mobility. Frank opined, "To begin with, a system for delivering electricity must be in place. Thus, there must be an increase in the number of charging stations and a general campaign to raise awareness.

"The importance of consumer education in shaping or altering user behaviour is something I now hold in the highest regard. I think that's a good place to start thinking about what we can do next. Achieving long-term viability requires educating the consumer; only when they have faith in the new technology will it be widely adopted.

"The proliferation of sustainable infrastructure serves as a sort of logical conclusion. It's not hard to arrange for vehicles to be made available. I think you need to, because the first step is convincing people that this is something they should care about, something that will help them and their children, and that will lead to new opportunities and better lives. And then, I feel like the rest falls in underneath it. Large amounts of time and effort will need to be invested in planning the infrastructure."

The continually changing commuting habits of GenZ and Gen Alpha have put a premium on creating reliable, environmentally friendly public transportation systems. Elaborating further on the subject, Frank stated, "When considering the transportation preferences of persons in their twenties and thirties, or even earlier, I think you'll find some interesting dynamics at play. They might have somewhat dissimilar tendencies. This is something I've noticed in my own children, who fall somewhere in the middle of those demographics where transportation, particularly personal or owned vehicles, may not be as important.

"My guess is that a combination of factors is at play here, including a change in perspective across the generations about what makes for the best mode of transportation. In the end, perhaps practicality will triumph over property.

"So, I think Dubai and the Gulf states are really ideally positioned to experiment in this area where you might have private transportation but transportation as a service mobility because of their organisation and ability to connect things at the state level."

By 2030, Etihad Rail plans to have passengers riding between Abu Dhabi and Dubai in under 50 minutes, an announcement that was made last year. Abu Dhabi and Oman will soon be connected thanks to a new agreement between Etihad Rail and Oman Rail, which was revealed last month. The Freight Rail service is now active and is used to move goods and commodities across the emirates, eliminating the need for large trucks to travel on UAE roadways. If the railway is finished quickly, it will soon be used to move workers and people from several emirates.


Dave Colson

Frank Menchaka at AV Summit

Sharing his views on this development, Menchaca said, "There's a lot of potential there, yes. Train travel from the Tokyo Metro to the station where you may catch the bullet train to Nagoya is highly convenient, fast, and fun thanks to Japan's impressive railway infrastructure. Plus, everything is neatly and efficiently put together.

"Well-organized regions can see enormous success with a strategy that combines high-quality, environmentally friendly high-speed rail with Metro and, perhaps down the line, micromobility devices like scooters."

"I think it's incredibly intriguing and has potential in places like Europe and the Middle East, where the land space is relatively small and a coordinated relationship between Metro, high-speed rail, and micromobility is easier to establish."

"In my opinion, a holistic approach is required if we are to realise the goal of sustainable transportation. If you're just getting used to the notion of driving an electric vehicle, or aren't sure if you'll ever be close enough to a charging station to make it before your battery dies, a hybrid is a great option to get started.

"My opinion is that they play a crucial role in connecting different areas. Therefore, I believe that the recent approval of the Inflation Reduction Act in the United States has resulted in the reinstatement of incentives for consumers to acquire electric vehicles. That being said, I believe that the infrastructure will be the primary factor in shaping consumer habits. In my opinion, the electrification of the planet is an inevitable trend. However, I believe hybrids are an excellent starting point," he added.

Menchaca believes that hybrid-electric propulsion will play an important part in the future of creating a cleaner environment, and he went into additional detail about this function, "Businesses in every sector of the global economy are starting to take the issue of their goods' and their own contributions to global warming very seriously. In favour of the Paris Climate Accords, I believe there is a drive to lessen the world's reliance on fossil fuels and achieve a goal of zero net emissions by the year 2050."

"Due to its size and organisation, Dubai is well-suited to adopt a truly integrated systemic approach to sustainable mobility, one in which infrastructure is placed everywhere cars are used and the government takes an active interest in this topic. We are now developing educational programmes in the States, to prepare individuals for entirely new types of employment.

For example, service chargers are essential because of the wide variety of charging options available. As a result, a brand-new occupation—the service technician—is emerging within the sector of electric vehicle supply infrastructure.
"Not only that, but there are several high-paying, newly created positions in the field of clean technology. I think this field has a bright future, and I think there is a big need to train new people to find and buy materials for batteries.

"According to what I've read, the demand for lithium-ion batteries will require a tenfold increase in the workforce over the next decade. This is an exciting time in the economy because, if the technologies are finally ready to be put into action, it will necessitate the creation of a whole new set of jobs and a whole new set of skills. Furthermore, I believe that Dubai serves as an excellent example of such a showcase state," Menchaca added.

As renewable power increasingly depends on electricity, the battery storage system will become increasingly important. Because of this, the resources, finance, and production of these batteries will be confined to specific regions where these factors converge. Now, the bigger question is how the area plans to meet the high demand for systems that store and use electricity.


Frank Menchaka

Answering that query, Frank commented, "In the United States, where the Inflation Reduction Act has placed a premium on bringing manufacturing processes back home (in particular, the production of batteries), this is a topic of intense debate. There is considerable enthusiasm for the United States to increase its role in the global mining and development of batteries containing rare earth minerals.

"International politics are a driving force behind this development. As for the geographical aspect of your inquiry, I find it fascinating that so much effort is being put into producing hydrogen. Electrolysis is a way to make hydrogen that is not limited by the same geopolitical factors as, say, lithium, cobalt, or nickel.

"The idea that it is possible to create infrastructure for hydrogen fueling and energy storage in any region is also highly intriguing. You may observe the construction of European Gigafactories. In that regard, I anticipate the coming decade to be one of great excitement and change."

Sharing what he envisages the future holding by 2032, Frank points out, "As I stated, Dave and I travelled to Dubai in November to attend an aviation show. While there, we were struck by how much government and industry leaders had accepted the reality that the region's way of life would have to change if electrification wasn't embraced.

"The structure of the Middle East makes it an extremely promising region. And because of the interest and acceptance that sustainable energy must be implemented, I believe it will be in a fantastic position in ten years, with a refined transit system and a formed idea of urban metabolism, where you have the city that synchronises all of these different systems, and transportation is key.

"In the Middle East and Dubai, specifically, this kind of approach to this concept of sophisticated urban metabolism integrates all of these different systems that involve combining a number of distinct mechanisms."


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HYBRID-ELECTRIC PROPULSION SET TO REVOLUTIONISE THE AUTOMOTIVE INDUSTRY

Although progress toward the electrification of the vehicle parc will continue to face obstacles it also showcases promising opportunities that lie ahead. This is especially true in urban areas where pollution, traffic, and security are all pressing problems. New ideas for electric, connected, autonomous, and shared mobility are being developed by industry players, thereby increasing the pace of technological innovation within the automotive industry. Over the past decade, the industry has received over US$400 billion in investment, with the most recent US$100 billion coming in the year 2020. Investments are being made in both established businesses and new ventures that are developing solutions for the widespread adoption of electric mobility, vehicle connectivity, and autonomous driving. With the advent of such advancements, it is expected that the price of EVs will drop, and electric shared mobility will become a viable alternative to individual car ownership. While the rate and scope of change will vary across vehicle categories, electrification will play a significant role in the overall transformation of the mobility industry and present significant opportunities. Introducing brand-new EVs to the market is a crucial first step towards achieving rapid and widespread adoption of electric mobility. Electric vehicle (EV) producers, suppliers, financiers, dealers, energy suppliers, and charging station (CS) operators, to name a few, must all collaborate for the transformation to be a success.

Since the demand for electric vehicles is increasing as a result of rapid technological advancements, the electric vehicle market is growing rapidly in the Middle East and Africa. Increasing demand for electric vehicles, government incentives and subsidies for electric vehicles, and rising environmental concerns are all contributing to the market's expansion.
Currently, the market's expansion is being stymied by the high entry price.

Commenting further on the current trend in the electric and hybrid vehicle domain, Mahmut Gazi Bilikozen, Automechanika Dubai's Show Director stated," Last year during Automechanika Market Outlook 2021, interestingly, 40% of Middle East operators reported that they have received customer enquiries for alternative fuel vehicle products and services. Despite this development, more than half the respondents (55%) from within the garage and workshop sector admitted that they have not yet invested in the new equipment which will be needed to service electric vehicles though the majority say they know they need to invest but have not yet begun the process."

Stephen Louis, a Key Account Manager for Axalta Premium Brands, believes that the industry will face a number of challenges and opportunities in the advent of these changes. “New technology is going to present the collision repair industry with a lot of challenges, whether that’s for electric vehicles or cars with other features,” he said.

According to a report by Research and Markets, a Dublin-based market research firm, because of its superior infrastructure for electric vehicles, Dubai has captured a larger share of the regional market than any other city in the area. Efforts are being made by both public and private entities to improve charging technology in order to shorten the time needed to recharge electric vehicles. The Saudi Cabinet has approved small price hikes for gasoline and diesel as part of the country's Fiscal Balance Program 2024. Including the VAT, the price of regular gas rose by 83% over the previous year, while the price of premium rose by 127%. The electric vehicle market in the Middle East and Africa is highly competitive, with major players including Tesla, Inc., Hyundai Motor Company, Volkswagen Motor Company LTM, Bayerische Motoren Werke AG, and others.

Impact of COVID-19 on the Market for Electric Vehicles

Public transit was severely curtailed during the COVID-19 pandemic. The widespread lockdown caused by the pandemic and later by the continuation of remote working and hybrid working opportunities the global automobile market, which includes electric vehicles, experienced a precipitous decline in sales. Currently, several manufacturers are reevaluating their business strategies and others are turning to R&D to produce state-of-the-art electric cars.

It was announced that during the lockdown period all commercial vehicle assembly plants will be closed, not just in Saudi Arabia but everywhere in the world. As an import-dependent economy, Saudi Arabia felt the pinch when imports were restricted. Furthermore, sales dropped to single digits as showrooms were closed. Since the first quarter of 2020, when oil prices first began to fall, the economy has been shrinking. Nonetheless, the non-oil revenue sector has begun to revive since the market lockdown was lifted, which has provided an economic boost to the market.

Demand for high-performance, low-emission, and fuel-efficient vehicles is expected to rise in the years ahead, which will have an impact on the market. The populace showered plaudits when the government of Saudi Arabia established stringent regulations governing vehicle emissions. It is expected that low-emission vehicles will sell well in Saudi Arabia because of the country's growing environmental consciousness and the fact that the price of electric vehicle batteries has dropped.

Several initiatives have been launched by the Saudi Arabian government to increase the popularity of electric vehicles. A memorandum of understanding (MOU) has reportedly been struck between Saudi Arabia and the United Kingdom to battle climate change and support sustainable energy sources in order to reach the Saudi Vision 2030 targets. It is anticipated that the launch of a brand new facility would aid in the training and education of a large number of individuals and lead to the creation of several new jobs. All of these elements will help the electric commercial vehicle industry in Saudi Arabia expand in the next years, boosting the country's economy.

ev-agencies / The Economic Times

The government of Saudi Arabia has been encouraging the use of electric vehicles as a top priority in its efforts to better the country's air quality. The demand for EVs is being driven by the rising use of EVs as a means to reduce pollution and carbon emissions, the increased use of EVs to reduce emissions, and the rigorous rules and regulations governing vehicle emissions imposed by governments. Several governments offer financial incentives, including tax exemptions and rebates, subsidies, and discounted parking and toll costs, to encourage the purchase and use of electric vehicles.

To produce electric vehicles, Lucid is working with the Saudi Arabian government to construct the country's first manufacturing facility dedicated to the industry. Government officials have set a goal of ensuring that 30 percent of cars in the nation's capital are covered by insurance. Lucid has declared plans to invest in the development of the sophisticated electric vehicle manufacturing business in order to fulfil the rising demand for EVs. To further boost Saudi Arabia's electric car manufacturing and sales, the National Industrial Development Center (NIDC) is actively courting key original equipment manufacturers.

As petrol costs climb in the UAE, hybrid and electric car demand rises

According to Al Futtaim Automotive, a car dealership in the United Arab Emirates that sells brands like Toyota, Lexus, and Honda, rising gasoline prices are a major, but not the only element at play when it comes to making the switch to electric vehicles.

“Today, more than ever, people want to drive electric cars. The rising cost of fossil fuels is certainly a contributing factor, but more consumer education and enthusiasm for the technology are also driving this development. As current owners are expected to upgrade to newer hybrid and electric models, and as more and more people become aware of the benefits of hybrid mobility, I anticipate a further rise in demand for hybrid and electric vehicles in the years to come,” stated, Vincent Wijnen, Senior Managing Director, Al Futtaim Automotive.


Hybrid-Electric / SlashGear

Recent research commissioned by Audi Abu Dhabi and conducted by YouGov found that 52% of customers are interested in making the switch to hybrids or electric vehicles. One-fourth of the 1,000 persons questioned are holding off on buying an electric vehicle (EV) until more models become available, and 14% have hybrid-buying remorse.

Drivers must compare the higher upfront cost of electric and hybrid vehicles against their lower total cost of ownership over time. Mark Austin, General Manager of Audi Abu Dhabi, countered that drivers may cut costs by switching to electric vehicles. He said, "Interest in EVs has continued to rise naturally over time, but higher petrol costs have clearly expedited the shift in consumers' mindset towards EV adoption."

Electric vehicles offer excellent efficiency and the lowest carbon emissions per mile when considering the whole lifecycle of energy used in generating, transporting, and utilising fuel, which is commonly referred to as 'well to wheel. The average cost of filling a gas tank is around Dh270, while a full charge of an electric vehicle's battery using a 110 kWh charger only costs Dh8.25. One more way that electric vehicles benefit their owners is through lower running costs.

Electric vehicle technology faces obstacles

Despite initiatives throughout the years that have made it easier to utilise electric vehicles, such as expanding the number of charging stations and providing free Salik and designated parking in Dubai, the EV sector is still in its infancy in the UAE.

Vitali Bielski, Associate Director of Mobility at growth strategy and consultancy firm Frost & Sullivan, Dubai, UAE argued for a national road map. To paraphrase, "the main (problem) is the lack of GCC-wide or even county-wide EV policy or a plan," he stated. However, there is a lack of a well-defined legal approach that would increase the number of EVs on the road, despite the fact that governments in Gulf states are open to the idea. While governments typically look to the auto industry to steer EV market developments, "most national sales companies and distributors expect some type of government incentives (monetary, non-monetary, infrastructure-related)."


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MIDDLE EAST IS IDEALLY SITUATED TO SERVE AS A MAJOR ELECTRIC VEHICLE (EV) PRODUCTION AND DISTRIBUTION CENTER

Many nations are turning to EVs as a means of cutting carbon emissions as they work to meet their climate goals. As a result of global initiatives to diversify supply chains and the push to adopt green technology, the Middle East Region is in a prime position to capitalise on an opportunity for EV production. Drive Type (Plug-in Hybrid and Pure Electric), Vehicle Type (Passenger Cars and Commercial Vehicles), and Geographic Region all contribute to the complexity of classifying the EV market in the MENA region (United Arab Emirates, Saudi Arabia, South Africa, Egypt, and Rest of Middle-East and Africa).

According to a report published by Mordor Intelligence, a research firm, the EV market in the Middle East and Africa was worth US$40.25 million in 2021 and is projected to be worth US$93.10 million by 2027. A compound annual growth rate of 15% is predicted for it during the next few years. (2022 - 2027). It's inevitable that the COVID-19 pandemic will have an effect on the electric car market in the Middle East and Africa. As the market for electric vehicles has slowed in the region, many factories have been forced to close because of the ongoing lockdowns, the need to adhere to socially distant norms, and the scarcity of personnel necessary to run manufacturing lines while maintaining all necessary safety precautions. However, the rapidly increasing year-over-year adoption rate of electric vehicles across the area is anticipated to lead to substantial growth in the market. During the forecast period, the market is likely to be driven by the increasing attention of governments across the region to promote the usage of electric vehicles and the growing awareness of energy storage solutions in the renewable-based power sector. Additionally, in the future years, the EV market in the Middle East and Africa is projected to benefit from the expansion of the 5th Generation-based communications network and the implementation of Vision Documents in Saudi Arabia, the United Arab Emirates, Qatar, and Kuwait.

The World Bank reports that manufacturing contributed 14% to GDP in the MENA region in 2018, up from 12.6% in 2016. Governments in the region are actively working to encourage manufacturing as part of their diversification efforts in order to meet the needs of their citizens and the economic aspirations for the year 2030 that have been inspired by technological disruption.

Lucid, a producer of electric vehicles, said last year that it intended to construct the first international manufacturing factory in Saudi Arabia, with annual production of 150,000 vehicles. The facility would be located in the King Abdullah Economic City.

The United Arab Emirates, meanwhile, hopes to have 42,000 EVs driving throughout the country within the next decade. The United Arab Emirates (UAE) opened its first electric car production facility in Dubai Industrial City last month at a cost of US$408 million. The facility has a yearly capacity of 55,000 vehicles. Tesla is leading the drive in the GCC region's EV industry, but other brands, such as BMW, Audi, and Mercedes-Benz, are hot on its heels.

Elaborating further on this line, Noor Hajir, head of transport planning and mobility at WSP Middle East, stated in her recent media outing, “Positive signs may be seen in the Gulf region, with many developers, especially in Saudi Arabia, embracing greener options and future mobility solutions like electric vehicles to assist them reach their long-term net-zero goals. Developers are increasingly installing electric vehicle charging stations in high-traffic areas like shopping centres and central business districts as a means of advertising to and enticing customers.”

Hajir is pessimistic that the region will ever have the infrastructure in place to enable public and private EV adoption a reality. She made these comments to a Middle Eastern media outlet: "The Middle East may be behind the curve compared with more established nations in providing roadside infrastructure to facilitate and reward mass private EV ownership, which relies heavily on public sector backing."

As more and more electric vehicle (EV) models are released every year, there has been a gradual increase in demand in the Middle East for these environmentally friendly vehicles. In line with its promise to achieve zero net carbon emissions by 2060, Saudi Arabia plans to have at least 30 percent of its vehicles be electric-powered by 2030.

Middle East Genreated toward EV / PYMNTS

Varying countries in the Middle East are at different stages of EV infrastructure development, according to Dr. Hamid Haqparwar, managing director of BMW Group Middle East. However, he shares the opinion of many other specialists that the region's long-term trajectory is obvious. Mass adoption of electrified vehicles per market is "a matter of when, not if," and greener modes of transportation are a major part of the sustainability visions outlined by governments.

Manufacturers will continue to grow their EV portfolio, according to Haqparwar, who claims that the region is seeing a greater choice of EVs reach its markets during the present "transition" phase. He told the media that rising demand in the Middle East was a result of supply increases and infrastructure developments. Within the next five years, I anticipate increased demand for electric vehicles.

Raw Resource Accessibility Can Boost The Region

The entire Middle East is on the edge of discovering a completely new sector which is ideally linked with its aim of becoming a worldwide EV manufacturing & sales hub, in addition to capitalising on a chance for EV production. The region needs to prioritise both the manufacture of energy storage units and the raw materials needed to produce these units if it is to acquire the status of global EV manufacturing and sales hub. According to Worley's analysis, significant quantities of copper, lithium, and other natural resources lie beneath the surface in the Middle East, making it an ideal location for the production of these energy-storing devices.

There is a geological foundation spanning two continents and 33 nations called the Tethyan mineral belt. It begins in western France and winds through the Middle East and into Malaysia, where it emerges into the open. You can find a lot of valuable base metals in the belt. But because so much of it has been under-explored up until now, it is poised for major new discoveries. Darryn Quayle, Worley's Vice President of Resources, adds, "The belt is a comparatively undiscovered portion of the Earth, compared to mining zones in the Andes or Africa." However, our investigations have led us to believe that substantial copper, lithium, and other mineral resources lie beneath the earth's surface. Electric vehicles, wind generators, batteries, and many other technologies are dependent on these materials to function. Quayle emphasises that "the Tethyan belt extends across the Kingdom of Saudi Arabia." As the Kingdom strives to become a major role in the global energy transition, this is a significant potential for its burgeoning mining industry. Along with Oman and other countries in the area, it is quickly adapting to this new reality by establishing itself as a "emerging mining nation."

While Saudi Arabia is undergoing its most profound and economic revolution in its history, the country is also experiencing a surge in demand for commodities used in the energy transition. Quayle states, "The Kingdom continues to become more outward-looking and progressive, and its Crown Prince is committed to diversifying the country's traditional oil and gas-based economy.

The government's resolve to decarbonizing the country by 2060 is informed, in part, by the realisation that manufacturing requires access to low-carbon energy. Low-carbon energy sources should be prioritised wherever they may be used as part of the energy transition. And it all starts with the first shovelful of dirt that the miners haul out. Quayle explains that "about 12% of global produced energy is consumed by mining and its supply chain," with that number rising to almost 20% of global production in some emerging countries. Creating a battery uses up to twenty times as much energy as the battery can store, so it's important to consider this while sourcing materials. 'Over the life of a battery, the CO2 reductions pile up several times over,' he says. An electric vehicle's carbon footprint is greater if its battery anode was manufactured using electricity generated by burning coal rather than renewable energy. That's why it's so crucial to consider the carbon intensity of the energy used in producing the anode and cathode, the battery's two most vital components. This is why Saudi Arabia is an ideal location for the growth of these sectors.

What the Middle East has going for it in terms of competition

Saudi Arabia is positioning itself to attract energy-intensive sectors like anode and cathode production because of its capacity to create enormous amounts of solar power and considerable wind power. In addition, it possesses the necessary components to complete the task. In the Western Hemisphere, Europe is leading the charge toward a clean energy future and widespread use of electric vehicles. However, the Middle East is a perfect fit for the region as a whole. Building a mining or battery processing facility in Saudi Arabia is substantially less difficult than in the United Kingdom or northern Sweden. The cost-competitiveness of renewable energy sources also means lower operating costs. As a result, the Middle East may become a more attractive destination for importing battery-grade materials, reducing supplies to Europe, where the majority of the current demand is. With this newfound wealth, the mining and processing industries in the Kingdom may quickly grow. Although some improvements to the underlying infrastructure are still required, Quayle observes that the will to progress is present. There are plans to triple the rail network and add an additional 1,000 km of track to transport the million tonnes of raw material to local processing facilities in Saudi Arabia because, while the country has excellent pipelines and ports for oil and gas, it is impossible to fit cathode and anode material into a pipe. Ports will also undergo alterations.

These changes are a result of the worldwide competition to construct 'gigafactories,' which are enormous battery plants capable of producing hundreds of thousands of packs to aid the automobile industry's transition to all-electric vehicles. Approximately 260 gigafactories are now being built around the world. There are over 160 in China, while the rest are spread around the West. It's the beginning of the industrial revolution. These mega-factories require massive amounts of inputs. The World Bank's Climate-Smart Mining team estimates a need for five hundred percent more lithium, cobalt, and graphite, one hundred percent more nickel, and seven percent more copper, each of which is a staggering figure when placed in the context of the current global copper market. "We're in a race for commodities," Quayle says.

EV charging-station / EY

The Middle East must play a pivotal role in resolving these shortages. The raw materials needed to power the proposed gigafactories are in short supply, but the Middle East can make up the difference over the next 15 years. Saudi Arabia has the potential to lead the way in the development of an integrated mining supply chain for energy transition minerals, albeit this is not something that can happen quickly. Quayle claims it can step into the position of cathode and anode aggregator and supplier to battery manufacturers. As long as a mine's output satisfies certain specifications, the mine's owners can sell that product to a temporary cathode or anode manufacturer, he explains. Using its abundant, cheap, renewable power source, Saudi Arabia can generate vast quantities of high-quality cathode and anode material at a single site. It may save a lot of money on transportation if the raw materials were processed close to the mines, which would be dispersed across the Tethyan belt.

Imparting Time-Tested Knowledge To A Sector In Flux

Mining businesses and investors find the Middle East and Saudi Arabia in particular attractive because of the region's track record of successfully completing large or complicated infrastructure projects for the oil and gas industry. This means that it can rapidly build sophisticated infrastructure, which is essential in the modern mining industry. The mining industry has an opportunity to reimagine its place in the manufacturing landscape. How to supply massive quantities of material rapidly is a basic problem that the global mining community must work together to address. And that's a once-in-a-lifetime chance for hopeful miners with untapped supplies of key ingredients for decarbonization just under their feet.

Saudi Arabia may broaden its economic base by supplying a newly emerging market committed to cutting carbon emissions. Furthermore, by providing the globe with the essential resources found in the Tethyan belt, it can hasten the process of becoming carbon neutral.


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UAE DESIGNING BLUEPRINT FOR AN CLIMATE FORWARD TRANSPORTATION SYSTEM

Globally, the UAE has often been seen as one of the most unsustainable countries, however, if you look at it closely, the UAE has made far greater strides toward sustainability than almost any other country in the last decade. If we consider the development of sustainable approaches to transport, this becomes evident.

Transportation of goods and services accounts for 25% of total GHG emissions.That's a massive share of the climate change problem, and one that affects all of us. It does mean that it is something that can be worked on, with the potential for positive change. As the world looks to move away from the status quo, it also means that there's a huge opportunity for new modes of transport and new ways of organising ourselves socially. Sustainable transportation is transportation that is more energy efficient and based on renewable energy. There are some very compelling reasons to move away from conventional, fossil fuel-based transport systems.

The World Health Authority attributes 7 million deaths per year to pollution caused by private and commercial vehicles. A Harvard University study along the same lines asserts that 8 million people died in 2018 from fossil fuel pollution, significantly higher than previous research suggested—meaning that air pollution from burning fossil fuels like coal and diesel was responsible for about 1 in 5 deaths worldwide. This enormous figure emphasises how real the effects of pollution are and how important it is to do something about it. Improving transportation also helps fight climate change, improves air quality and, by extension, public health, and makes it easier for people to move around socially and economically.

What are the fundamentals of a sustainable transport system? Conventionally, the transport pyramid has private cars as the primary mode, public transport as the second, and pedestrians and cyclists as the third, and this is the current hierarchy we see in the UAE. A sustainable version would be turned upside down, de-emphasizing privately owned cars and expanding public transport, along with electric and hybrid-powered cars and trucks, vehicle sharing programs, and micro mobility solutions like bicycles and scooters. A great example of this would be Expo 2020. If you visited the site, you will remember that pedestrians were at the top of the tree, shared scooters and bikes were also an option for getting around, and most people arrived at Expo. The car was the least useful way of getting to the site.

Sustainable transportation has five key elements: public transport, electrification, shared mobility, soft modes of transport, and innovative new communities. All of these need to be supported by: infrastructure development like metro systems and cycle lanes, technology like solar charging options, government policies that support the shift to a new way of moving, and investment to pay for all these. Electrification is perhaps the best known aspect of new modes of transport, with Tesla being the flagship. The benefits are numerous, there are no direct emissions from these vehicles, and if they are charged from renewables, then there are no emissions at all. Electric vehicles are also able to go where conventionally powered cars and buses can't because of the absence of noise and other emissions. Shared mobility and public transport like ride shares, metro buses, etc. The more extensive, comfortable, and reliable public transport options like the metro or bus there are, the more people will decide that car ownership is unnecessary. Socially, it means greater equity. Soft forms of transport are bike shares, scooters, and, of course, walking. They are key to solving the first- or last mile problem. New, sustainably designed communities will be denser, with better public transport and soft transport connections. Such a comprehensive framework has two main effects. It can ensure that people and goods move around in a self-sustaining, intelligent, and carbon-neutral way.

So, how is sustainable transportation faring in the UAE?Overall, it is improving with several flagship projects like Dubai Metro, Etihad Rail, and the rapid growth of Careem and Uber over the past few years. There are still many hurdles to overcome. The UAE and the wider Gulf are not ideal places to encourage people to take the bus or walk. The harsh desert climate tends to have pleasant, warm winters and incredibly hot, humid summers. The cities were designed for cars and tend to be quite spread out and not pedestrian friendly. Culturally, the car is king here with its guarantee of privacy and comfort. Moving toward a more sustainable way of getting around faces some challenges.

UAE 50th mapping the nation journey / Gulf Business
Ecoliteracy / istock


UAE to host global climate summit / Khaleej Times

The Dubai Metro opened in 2009 and since then has reduced carbon dioxide emissions by 2.6 million metric tonnes, with the cumulative financial benefits amounting to Dh115 billion, according to its chairman. It has transformed the city's public transportation system.The metro also connects to a network of trams, buses, and water taxis, as well as other soft transport options, which means that many commuters can get around the city without a car, as they would in London, Vienna, or Hong Kong. The metro itself is a fantastic addition to the city, which raises the quality of life rating for residents and visitors alike and helps it compete with more established international cities.

Staying with rail, the Etihad Rail project can be seen as another significant step forward in building a sustainable transport network in the UAE. The railway will redefine logistics and transport in the region through a modern, sustainable network that will connect the seven emirates of the UAE to neighbouring GCC countries. Both freight and passengers will be transported eventually. The number of passengers is projected to reach more than 36.5 million passengers annually across the country by 2030. Passengers will be able to commute between Abu Dhabi and Dubai in only 50 minutes, between Abu Dhabi and Fujairah in only 100 minutes, between Dubai and Fujairah in only 50 minutes, and between Abu Dhabi and Al Ruwais in only 70 minutes. All these journeys will be powered by electricity as opposed to petrol, resulting in the avoidance of millions of car trips.

Air travel is an essential part of life for many of us here in the UAE, whether for business or travelling home to see family. It's more of a necessity than a luxury, so any efforts to make air travel less polluting should be very welcome. It's very difficult to reduce the direct impact of air travel because the key activity to flying is burning jet fuel. Etihad Airlines in Abu Dhabi is partnering with Boeing on a sustainable aviation fuel project. They also offer their passengers the chance to offset their individual carbon emissions through donations to forestry and clean energy projects. While Emirates doesn't have an offset option, they have invested heavily in solar power options for their ground operations and are monitoring SAF developments.

Aviation is the hardest sector to abate, as the core business involves burning massive amounts of jet fuel.

What can we do as individuals to make sustainable choices when it comes to moving around?
There is a mixture of big decisions and small choices that we can all make. Walking when you can is the easiest and most sustainable way you can get around. If feasible, using a bike scooter for slightly longer journeys also means emission-free travel. And if it's possible, choosing to use the metro or bus instead of your car saves on GHGs and means you don't need to find a parking space. As mentioned earlier, choosing to offset your air travel using an app like Carbonclick is also an option for those that want to actively offset their CO2 emissions. Etihad Airlines offers this option to customers flying out of Abu Dhabi, and people may choose to offset other types of travel like car journeys in the future.

Going electric in your next vehicle purchase would be a significant step in terms of large personal decisions.Tesla has made significant inroads as the class leader in EVs in the UAE market.However, even the Toyota Corolla, a staple of UAE roads, is available as an electric version. With the current high fuel prices, the daily savings on fuel are significant enough to make going electric more attractive than ever. And while not all of us can afford a new Tesla, a quick look on Dubizzle shows EV options starting around 80,000 AE. At the larger end of the spectrum, choosing to move to a denser, more sustainably designed community also means you will be able to travel in a better. The Sustainable City communities in Dubai, and latterly in Sharjah, and the UAE's original sustainable city- Masdar, are dense, walkable, and encourage pedestrians. In this, they echo the oldest parts of Dubai by the Creek, where roads are narrow and people lived in close proximity to each other.

While the UAE is often painted as one of the more environmentally unsustainable countries in the world, it's great to report that all these options are available here. Sustainable communities are springing up, and public transport is expanding and becoming more comfortable and convenient. Softer modes of transportation, such as bike sharing and lift sharing schemes, are now available.While there are definitely factors that make it challenging, the direction of travel for sustainable transport is definitely positive.

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GCC IS ON THE CUSP OF UNLOCKING US$400 BILLION TREASURE TROVE

A new report by Strategy& Middle East, part of the PwC network, titled Sustainable Mobility: Inverting the Transport Pyramid, estimates that the governments of the Gulf Cooperation Council (GCC) could release US$400 billion in socioeconomic value through the adoption and deployment of sustainable mobility strategies and technologies. To achieve sustainable growth and lower their carbon footprint, GCC countries have set lofty targets. To this purpose, governments should promote eco-friendly and low-energy transportation options including electric and hybrid cars, car-sharing programmes, and micro-mobility solutions like scooters and bicycles.

"Personal automobiles are still the most common form of transportation. Mark Haddad, principal at Strategy & Middle East, remarked, "CO2 emissions and congestion have cost ramifications and inhibit our region from meeting sustainability targets." "To counteract this, a number of cities are constructing and updating their metro, tram, and bus networks. Others hope to implement these smart mobility technology within the next decade, he noted.

Adopting a five-pillar framework to sustainably upgrade the transportation sector is necessary to realise the full potential of sustainable mobility. Dr. Shihab Elborai, a partner at Strategy& Middle East, estimates that "this framework might release around US$400B in economic value over the next 20 years." The ability to transport people and things in a carbon-neutral, smart, and self-sufficient manner is a major benefit.

- ·Public transportation that is accessible to all uses a variety of modes, and is well-integrated and reliable is essential to environmentally friendly transportation networks. Until we have a totally electric fleet, governments should keep investing in these technologies.

- ·The electrification of transportation requires the establishment of a network of charging stations in parking lots located in densely populated areas. There was a global increase of 43% in EV sales in 2020, to 3.2 million units, despite a pandemic and a slowing economy.

- ·Solutions for shared mobility aim to enhance the number of passengers carried by each vehicle, boost asset utilisation, and speed up the transportation of commuters.

- ·By resolving issues with first- and last-mile connections, micro-mobility solutions can broaden the range of transportation options available to city dwellers and encourage more people to take public transit.

- ·In the communities of the future, residents will be able to easily access the services and amenities they need thanks to the sustainable urban planning that has been implemented. Key examples include Roshn and the Line at NEOM in Saudi Arabia.

Governments should invest in fundamentals as well to support the five pillars. One such factor is infrastructure. They can do things like convert streets into bicycle lanes or install charge stations for electric vehicles. Technology is another factor since it can compile data from numerous forms of mobility and then use advanced analytics driven by AI and ML to shed light on things like traffic patterns, consumer trends, and emissions efficiency. Better government policy can incentivise specific habits or modes of transportation, such as raising the price of owning and operating a car and promoting the shift toward green and sustainable forms of transportation. Money is important, too. Future transportation networks can be financed through public-private cost-sharing programmes. Several countries in the Gulf Cooperation Council (GCC) have made significant strides toward incorporating sustainability into their national development. The next step is to implement this strategy in the transportation industry. Improved sustainability results can be achieved by "inverting the mobility pyramid," making GCC cities more secure, healthier, and economically relevant for present and future generations of citizens.

Roadblock Ahead

Though the recent picture shown to the public might look very colourful and vibrant, achieving the set goal is not going to be a smooth ride. There is, however, another factor that is much more significant and one which can be seen gaining momentum over the past five years.

Sustainable-mobility / Travel Daily Ecoliteracy / iStock

This is the genuine, grassroots urge for change that wanes over the summer months but surges again in full force come September. Some of the most ecologically conscious people in the world live in the 'hype' communities of the Gulf, where people are accustomed to talking openly about global issues. And those residents, in turn, are eager to support government efforts to improve sustainability while also looking for opportunities to make personal contributions. Examples abound, such as the popularity of mass transit among tourists and the rise of electric cars and active mobility methods of transportation.

However, there is yet another impetus for natural development that complements environmental consciousness. The availability of alternate platforms and how well they meet travellers' needs at the beginning and end of their trips is a far more important variable to consider. After the lockdown, Dubai saw a significant increase in the number of people using e-scooters as their primary mode of transportation to and from work and a large increase in the number of people riding bicycles to get around outside of the normally tranquil recreational lane leading to Al Qudra. And there are a number of good reasons for this to be the case. Low-income people generally have lengthier commutes to work, so these platforms offer an affordable way to get there. As first and last-mile transport options, they connect public transit hubs to final destinations, easing a significant bottleneck in the present system. You can get from one place to another more quickly and easily than if you had to enter Sheikh Zayed road, take the next exit, do a U-turn, and then sit in traffic.

Despite such a fruitful stride taken by the denizens, the system continues to ignore the people's concerns. This organic conveyance is having trouble getting its message across to the proper authorities. Companies in the micro-mobility and active mobility sectors are cannibalising each other, with some sectors being oversaturated with platforms while others are left behind entirely. There are more bike lanes than there are footpaths, and they are crowding out the latter. One new rule or law appears every few months that make it more difficult for people to ride e-scooters. Some building projects are being undertaken without considering the possibility of route disruptions.


Emobility / Lanxess

The Voices Remained Unheard

The transportation pyramid needs to be turned upside down to counteract the pernicious impacts of car-centric planning. Better public transportation options and private green mobility platforms can only be achieved if the car culture is shaken up. Every portion of a city needs to have access to scooters, bicycles, and any other modes of transportation that may soon become mainstream. Instead of forcing pedestrians off the sidewalk, bike lanes should force cars off the road. A greater number of pedestrian crossings and pedestrian-only spaces are needed to make neighbourhoods more accessible by foot. There should be as few rules as possible for micromobility platforms. The time for half-measures is over; instead of viewing the disruption produced by bicycles and e-scooters on roads and highways as a problem, we should view it as a driver of positive change. Only by taking note of this disruption and formalising it will green mobility be possible in the future.

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