

# Conclusion. Key findings, key messages and recommendations

A fundamental, irreversible shift in the paradigm of transportation is underway. In coming decades, the dominant trend in this transformation is e-mobility – the accelerating growth of electric powered cars, vans, buses, scooters, trains and eventually ships and aircraft.

Given its diversity, the Arab region has the potential to pursue a variety of paths and approaches to e-mobility. Countries throughout the region have already made significant steps and pledges to adopt EVs and develop e-mobility industrial capability. This report has explored three different potential pathways that e-mobility could take in the Arab region over the next two decades and beyond.

Drawn from the report are key findings, key messages and recommendations, organized by type of recommendation. Some policy and legislative recommendations and some technical recommendations encompass an investment dimension.

Each of the recommendations supports the Sustainable Development Goals (SDGs). Given the high priority Arab nation governments and other sectors place on the SDGs, linking these e-mobility recommendations to SDG strategies and investments will be valuable to help advance them. Each recommendation notes a supporting linkage to one or more SDGs.

## Policy, legislative, regulatory

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### Key finding

By 2050, an estimated half of the countries in the Middle East and North Africa are projected to see their populations rise by 50 per cent or more from 2015 levels. Most of the growth will take place in cities. Traffic congestion caused by the very large numbers of cars in these large cities has material and measurable negative economic and health effects.



### Key message

Accelerating adoption of electric-powered public transportation, electric micro-mobility and mobility-as-a-service (MaaS) will diminish the harmful effects on Arab region cities from the increased traffic, congestion and CO2 emissions that will otherwise accompany rising urban populations.



### Recommendation

Develop a national sustainable urban mobility policy in each country of the Arab region, with capacity-building support as needed, to shift car drivers to more efficient and non-carbon producing forms of transportation.



### Key stakeholders

National policymakers, state and municipal government officials, private sector, civil society organizations, academia.

## 2



### Key finding

Electric buses are in use or being piloted for fleet-level deployments in Egypt, Morocco, Qatar, Tunisia and the United Arab Emirates. Jordan is developing plans to electrify its entire public vehicle fleet.



### Key message

There is already well-established and growing interest that must be encouraged and incentivized in the Arab region in public transport fleets, especially buses, that are powered by electricity or other clean fuels.



### Recommendation

Set national targets in every Arab country for procuring electric buses by 2025 and 2030.

Establish policies or legislation that enable transport systems at state and municipal levels to use innovative procurement models for e-buses and rail.



### Key stakeholders

National policymakers.

State and municipal government officials, private sector.

## 3



### Key finding

National bans on the production and sale of ICE vehicles are highly effective in changing the direction of future stocks of cars and buses by influencing automotive manufacturers' capital investment planning cycles and encouraging others to invest in alternative fuel infrastructure. To date no Arab country has joined the 25 countries that have set ICE vehicle phase-out targets.



### Key message

As subsidies become less necessary to promote consumer EV adoption, Arab Governments can prioritize non-fiscal incentives like banning ICE cars and buses. Resources can be redirected to investing in and promoting the complementary development of e-public transit, e-micro-mobility and MaaS.



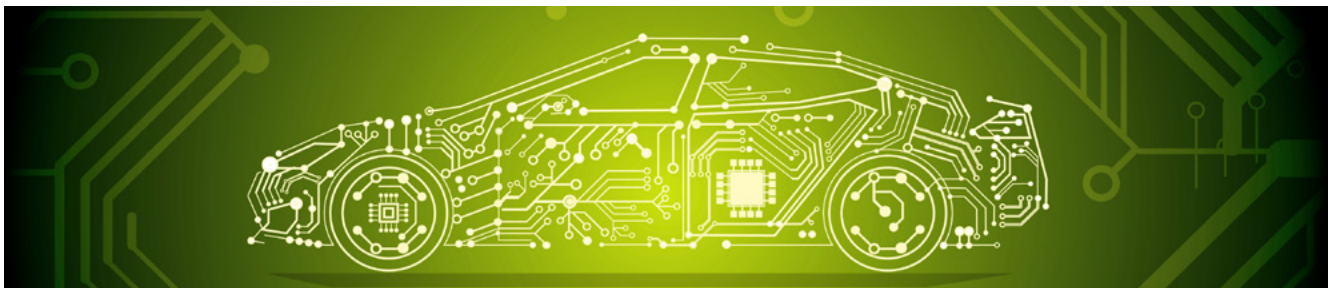
### Recommendation

Set ICE vehicle phaseout deadline mandates in all Arab countries that include all buses and other vehicles in the public transportation sector.



### Key stakeholders

National policymakers, private sector.



## 4



### Key finding

Electric micro-mobility is emerging and growing in parts of the Arab region including large-scale government-funded e-scooter trials, investments in fleet deployments by major non-regional providers and launches of local start-ups.



### Key message

To date in the Arab region, e-micro-mobility is taking off most and most quickly in the GCC, and especially the United Arab Emirates. Tax-based and other policy actions can enable expansion in some of the larger, denser and more congested cities in a number of other countries.



### Recommendation

Implement vehicle tax and vehicle insurance rationalization to promote electric two- and three-wheel vehicle sales and usage.



### Key stakeholders

National policymakers, state and municipal government officials.

## 5



### Key finding

Lack of clarity about responsibilities and jurisdictions among government agencies within cities, and differences in oversight approaches between different cities in the same country, are impeding the advancement of MaaS and putting at risk the ability to meet objectives of improving mobility, accessibility, equity and sustainability.



### Key message

Public-private co-creation of high-level governance and regulatory frameworks for MaaS will enable customization of business models to local markets within broad requirements for assuring social good alongside private sector stakeholder objectives.



### Recommendation

Develop national governance and policy frameworks for MaaS that regulators at state and municipal levels can align with for uniformity.



### Key stakeholders

National policymakers, state and municipal government officials, private sector.



### Key finding

While growth projections are encouraging, currently the EV take-up in the Arab region lags well behind much of the rest of the world. In several countries in the region, there is growing interest and effort to begin developing automotive manufacturing and supply chain industrial capacity. However, there is concern that these efforts will be risky until e-mobility adoption advances in the Arab region.



### Key message

Greater demand in the Arab region for electric cars and other EVs could motivate local companies to start up or grow existing businesses across the automotive and broader mobility value chains. This will increase their confidence that otherwise potentially risky investments will produce growing returns. Governments can help stimulate that demand through a variety of policies, advancing the trend of e-mobility overall and growing local e-mobility industries.



### Recommendation

Establish a coherent and consistent policy framework with clear strategic goals, incorporating economic, fiscal and other types of policy levers, to stimulate Arab markets for e-mobility and reduce investment risk for current and aspiring manufacturers and suppliers in the region.



### Key stakeholders

National policymakers.



### Key finding

Several Governments in the Arab region are supporting the development of local companies in the increasingly electric-powered automotive and broader mobility industries and their supply chains. Examples include the United Arab Emirates declaring the automotive industry an ideal long-term option for its industrialization strategy; Saudi Arabia through its National Industrial Development and Logistics; and Oman through its support of a local EV manufacturing start-up.



### Key message

More Arab Governments incentivizing and supporting mobility sector industry development, through investment as well as taxation and other regulatory powers, will help accelerate and scale the region's own adoption of EVs as well as serve economic diversification aims.



### Recommendation

Create and implement systems of policy, institutional, fiscal and financial support and incentives to Arab companies in e-mobility industrial supply chain ecosystems.

Use vehicle import duties and other automotive trade regulations to incentivize mobility system manufacturers to incorporate Arab suppliers in their supply chain.



### Key stakeholders

National policymakers, private sector.

National policymakers, private sector.



### Key finding

Unidirectional smart charging (V1G) and the bidirectional V2G/V2X infrastructure and utilization that would enable e-mobility and facilitate Arab region renewable energy transition both require a power market structure and liberalized energy trading policy between EV owners and utilities that financially incentivizes owners to charge EVs during non-peak-demand hours.

### Key message

For all Arab countries, current power market structures slow progress on the transition to renewable energy and the advancement of e-mobility in the region. A path toward an e-mobility future that incorporates V2G when the technology is available at scale is even more challenging unless and until current power market structures change.

### Recommendation

Revise legal, policy and regulatory frameworks to restructure power markets, increase private participation and develop multi-producer and multi-buyer models.

### Key stakeholders

National policymakers, state and municipal government officials, private sector.



### Key finding

The tariff structure that characterizes the Arab region power sector model, along with energy subsidies that constitute upward of 10 per cent of the region's collective GDP, impede large-scale transition to variable renewable energy and a vehicle-to-grid (V2G) and vehicle-to-everything (V2X) e-mobility future.

### Key message

Only when power sector reforms affecting tariffs and subsidies are implemented will Arab countries be able to operate the grids that they and other countries need for e-mobility to scale and to help enable the region's energy transition.

### Recommendation

Eliminate the subsidies and implement time-of-use tariffs for electricity.

### Key stakeholders

National policymakers, state and municipal government officials, private sector.



### Key finding

Scaling the number of EVs of all types to fully gain all the climate change mitigation and other public benefits of e-mobility relies on actions outside the transport sector. This includes enabling significant increases in renewable electricity generation capacity and improvements in the reliable, dynamic distribution of electric power through the grids.

### Key message

If approached as a deliberate, integrated and mutually supportive objective of the transport, energy and environment sectors and ministries of Arab countries, the advancement and scaling of e-mobility can help facilitate the transition to renewable energy, smart grid modernization and the realization of numerous social and public health benefits.

### Recommendation

In each Arab country, form an e-mobility working group with a designated “national champion” to coordinate and integrate transport-related, environment, energy, telecommunications and infrastructure policies for mutual benefit and promotion of mutually supportive renewable energy transition and e-mobility objectives.

### Key stakeholders

National policymakers, state and municipal government officials, civil society organizations, academia.

## Policy, legislative, regulatory



### Key finding

Interoperable charging infrastructure for EVs has demonstrated benefits in increasing user confidence and motivation to purchase EVs, promoting efficient capital investment, stimulating market competition, protecting infrastructure investments against obsolescence and enabling more optimal EV-grid integration.

### Key message

The Arab region's current very early stage of buildout of EV charging infrastructure presents an opportunity to prioritize interoperability before significant investment has been made. This will optimize the investment of public funds in transitioning mass transit systems to electric vehicles.

### Recommendation

Establish national and regional standards requiring interoperability in charging infrastructure, especially for charging points deployed for public transit systems.

### Key stakeholders

National policymakers, civil society organizations, academia.

### Key finding

Digitalization is heralding a new era in the automotive and broader mobility industry. Many countries in the region are emphasizing digital skill development in their near- and longer-term economic diversification planning and working to implement programmes in support of that objective.

### Key message

Investment in developing employees with advanced digital and other skills relevant for the e-mobility sector will be transferable to, and from, green economy and other sectors that will also be part of Arab countries' economic diversification strategies and objectives.

### Recommendation

Emphasize mobility sector-relevant skills development in national and other education and training initiatives supporting economic diversification visions.

### Key stakeholders

National policymakers, state and municipal government officials, private sector, civil society organizations, academia.

## Investment

### Key finding

Public transport operators and governing authorities, with providers in the e-micro-mobility and MaaS sectors, are recognizing and acting on shared interests in creating integrated mobility ecosystems. Transit-oriented development initiatives are underway in the United Arab Emirates and Saudi Arabia. However, in most Arab cities that have micro-mobility and MaaS, they are not yet optimally connected to public transit.

### Key message

Accelerating urban development that proactively designs for interconnections between electric-powered micro-mobility, MaaS and public transit has the potential to increase the returns on investment in all these mobility modes beyond their individual returns. Benefits will include increased economic productivity, increased social equity, reduced carbon footprint and others.

### Recommendation

Provide grants, loans and/or subsidies from appropriate levels of government and aid agencies, and explore multilateral development bank funding, for urban redevelopment projects that purposefully integrate public transportation, electric micro-mobility and MaaS.

### Key stakeholders

National policymakers, state and municipal government officials, intergovernmental organizations.



### Key finding

In many Arab region cities, informal transport is the most common and widely used form of urban transit. The vehicles generate very large CO<sub>2</sub> emissions and other pollutants and will be difficult to integrate into any e-mobility pathway as the business model does not benefit from economies of scale or generate sufficient revenue to invest in innovations like EVs.

### Key message

Attempts to reduce informal transport through stricter regulations or competition from subsidized clean-power modes could be harmful to those making a living in this sector. Innovative financial incentives and other measures will be important to integrate the current informal sector into an e-mobility future.

### Recommendation

Provide financial and other support to impel informal transport sector operators to adopt EVs and integrate with public transit MaaS systems.

### Key stakeholders

National policymakers, state and municipal government officials, civil society organizations, private sector.



### Key finding

Global growth of electric mobility is spurring the emergence of new electric vehicle OEMs, including in the Arab region. It is expected that they will operate differently to traditional automotive OEMs with respect to where they situate their manufacturing and assembly plants and their allegiance to well-established suppliers at all tiers of the automotive supply chain.

### Key message

The ongoing transformation of global supply chains in the mobility industry ecosystem are creating opportunities for new Tier 1, Tier 2 and Tier 3 suppliers if such supplier companies emerge in the Arab region to meet the demand. New EV OEMs will want to operate and have supplier networks more local to the markets they serve, including the Arab region market as it grows.

### Recommendation

Prioritize creation of partner relationships with new and emerging EV manufacturers outside the Arab region.

### Key stakeholders

Private sector.

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### Key finding

Scaling the number of EVs of all types in the Arab region will require significant increases in variable renewable electricity generation capacity and improvements in the reliable, dynamic distribution of that power through electrical grids. Some of this investment is underway and planned but projects are lagging behind the need and face much difficulty gaining financing.

### Key message

The advancement of e-mobility, the transition to renewable energy and electric grid modernization in the Arab region are inextricably linked from a practical standpoint, but not yet in financing or in related policy or implementation. This poses risks to e-mobility advancement and to renewable energy transition in the absence of significant help that many of the region's countries will need to secure from external sources.

### Recommendation

Work with multilateral development banks and other international development and climate finance institutions to secure concessional and blended finance for grid expansion and modernization projects.

### Key stakeholders

National policymakers, intergovernmental organizations, private sector (finance sector).

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### Key finding

Models exist in China, India, Spain, and elsewhere that Arab mass public transit systems can emulate and adapt to become more renewables-based in their operations. This can help them to lay a foundation for renewables to become a larger component of their countries' and the region's overall energy mix.

### Key message

If systems are equipped with future V2G charging models, Arab region electric public transportation and MaaS providers could become a significant factor in grid stabilization and management and accelerate the use of renewable energy to power not only their vehicles, but also other sectors.

### Recommendation

Provide financial support or policy incentives to encourage transport service providers including MaaS providers to adopt V2G-capable EV fleets and charge on beneficial schedules.

### Key stakeholders

National policymakers, state and municipal government officials, private sector.



### Key finding

There are considerable social and personal emotional misperceptions about and barriers to EV adoption in any future e-mobility pathway. These relate to concerns regarding vehicle costs, driving ranges, charging times, uncertainty about charging infrastructure, and other issues.



### Key message

Increased and accurate information from authoritative sources can reduce misperceptions and misinformation about e-mobility as well as inform policymakers and other decision makers about legitimate problems with EVs and related infrastructure that can be resolved through regulatory, investment, technology development or other actions.



### Recommendation

Develop and deploy communications campaigns that incorporate Arab region success stories and other means to overcome social and other barriers to EV adoption and V2G charging models and inform strategies for overcoming these barriers.



### Key stakeholders

National policymakers, state and municipal government officials, civil society organizations, private sector, academia.

## Technical



### Key finding

Pilots and studies show that bidirectional V2G and V2X charging is capable of generating billions of dollars of value in forms including reducing the risk of grid overloading; reducing the need for utility infrastructure investment; maximizing the proportion of renewables in the energy generation mix; and enabling EV owners to help power homes and businesses and save money on their own energy consumption.



### Key message

With appropriate grid modernization and power market restructuring, bidirectional charging could make EVs pivotal to a dynamic management of supply and demand that will help Arab countries' grids integrate much more variable renewable energy into the region's energy mix.



### Recommendation

Ensure that grid modernization and expansion efforts incorporate technologies and operational and other steps necessary to enable bidirectional charging of EVs.



### Key stakeholders

National policymakers, state and municipal government officials, private sector, intergovernmental organizations.



### Key finding

The demand for EV batteries will rise by a factor of 15 by 2030 – in the Arab region alone, the market will be more than \$125 billion. Demand for EV charging stations will rise in tandem – conservative projections are for nearly 300 million charging points needed globally by 2040, requiring nearly \$600 billion in investment.

### Key message

Investments by Arab region companies to develop capability and capacity to serve the immense battery and charging infrastructure markets have the potential to create more jobs than any other investments in the e-mobility industrial ecosystem. Actions by Arab Governments should support the creation and scaling of these companies with financial and other forms of policy intervention.

### Recommendation

Prioritize the battery and charging station elements of the e-mobility supply chain as areas of focus for industry capacity development in the region.

### Key stakeholders

National policymakers, private sector.



### Key finding

Competition in EV markets for all types of EVs focuses largely on cost and range, but also on other features. Niche manufacturers are emerging with vehicles designed with niche market conditions in mind.

### Key message

Current and aspiring technology companies in the Arab region could focus on innovations optimized for local conditions and would have a substantial market to serve as well as opportunities in other high-heat geographies outside the Middle East. Policies by Arab region Governments to financially and otherwise support would help local companies to thrive in a lucrative new e-mobility sub-sector.

### Recommendation

Focus on developing EVs and related technologies that are tailored to distinctive needs and conditions of the Arab region as high-potential niche markets.

### Key stakeholders

National policymakers, private sector.