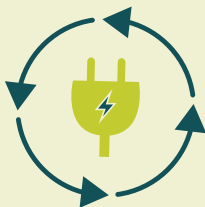




Recommendations spanning future e-mobility pathways and Arab country groupings

The **electrification**
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The electrification of mobility, in all transport modes and especially in land transport, promises important and transformative opportunities and benefits for the countries and the populations of the Arab region. Throughout this report we have described many of them. In Section 3, investment opportunities in electric public bus and rail transit systems, micro-mobility and mobility-as-a-service start-ups and the infrastructure for all those e-mobility modes offer new forms of public-private partnership, economic growth and social equity advantages, urban redevelopment and more. In Section 4, investment in the development of new industrial capacity across the entire e-mobility supply chain offers prospects for new kinds of success not previously seen in the region in diversifying the economies of multiple Arab countries. In Section 5, investment opportunities in renewable energy and electric utility modernization and expansion are spurred by e-mobility, and also make e-mobility in the region more scalable.

Realizing all of these and other opportunities and benefits requires actions, today, by decision makers in the public, private, non-profit and development sectors. It also requires a collaborative system approach. In Section 5 we described the importance of coordinated policymaking among the transport, energy and environment ministries of Arab countries to realize the potential “virtuous circle” of renewable energy transition, grid modernization and e-mobility. That is only one example of the kinds of integrated system approaches that will produce the greatest successes in advancing e-mobility. More will be needed, and all of them will demand structured planning and implementation that is thoughtful and deliberative about what steps must be taken in what order and what can and must be done in tandem.

A. Recommendations that apply to all three e-mobility pathways described in this report

In Sections 3 through 5 above, we provided recommendations that are distinctly valuable for how they support the particular “vector” that e-mobility takes in each of those report sections. They are: complementary development of electric public transportation and e-micro-mobility and MaaS; development of e-mobility industry supply chain capacity; and leveraging e-mobility as an enabler of grid modernization and the renewable energy transition. Those recommendations are among the actions that are important for Arab decision makers to begin working on in the near term in our assessment.

A number of recommendations in Sections 3 through 5 support all three of the e-mobility pathways we analysed, and would support any and all other pathways that the e-mobility trend could take in the Arab region. That cross-cutting integrative set of recommendations, with abbreviated descriptions drawn from the fuller descriptions in the individual pathway chapters, is provided below.

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

Decision makers of the transport, energy, environment and planning ministries of regional countries should review available models for such plans, confer with peers in countries that have employed them, then create a NUMP/ SUMP for their country.

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

New forms of finance should be made available on a priority basis for projects that are designed to integrate the “big end” of the land e-mobility spectrum (e-buses and electric rail

systems) and the “small end” (e-micro-mobility and MaaS EVs). Financing mechanisms from multilateral development banks and climate finance institutions should be among the approaches explored.

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

Mandating interoperability for the infrastructure powering EVs in the Arab region will be essential to scaling the adoption of e-mobility. Ideally, common standards for interoperable charging should be adopted region-wide.

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

Arab countries should establish their target dates and define the scopes of their future bans to include all public transportation vehicles. Where possible, financial and other incentives should encourage owners to accelerate the replacement of their ICE vehicles to get legacy stock off the country’s roads and recycle components.

5. 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

Governments in the region can stimulate demand for EVs through a variety of policies, advancing the trend of e-mobility overall as well as the more specific aim of growing local e-mobility industries. Greater regional demand for electric cars and other EVs could motivate local companies to start or

grow existing businesses across the automotive and broader mobility value chains, and stimulate global automakers to respond to the growth of markets with increased supply.

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

All Arab countries have plans and visions in varying forms for diversifying their economies over the next 5 to 30 years that include initiatives to improve education systems and provide skill training for citizens. In such programmes, skills relevant to the electric and digitalized future of mobility should be emphasized, which will also be valuable in helping countries diversify into numerous other digital industries.

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

Increased battery production and battery technology advancement, and increases in charging infrastructure production and deployment, are the lynchpins for the future of e-mobility. Investments by Arab countries and companies to develop the capability to serve these essential requirements will be important in helping e-mobility scale in the region as well as having the potential for significant local job creation.

8. 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

Meeting the region's renewable energy, climate change adaptation and e-mobility goals will require immense investments in the grid infrastructure. Financial assistance in the form of concessional loans, blended finance and climate funds to drive capital for the necessary grid infrastructure is a priority need. Eligibility criteria, key performance indicators

and special vehicles for such projects should be tailored for the current grid and power generation status in each country.

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

The e-mobility and renewable energy transition goals of Arab countries will be difficult to achieve under currently dominant power market structures characterized by vertical integration and a single-buyer model. These structures hinder the advancement of an electric mobility paradigm in which vehicles export electricity back to the power grid and to other powered devices and infrastructure. Arab countries should move towards a multi-buyer model. Additionally, engaging and increasing private sector participation through the creation of an enabling environment, adequate policies and favourable regulations are prerequisites for a more competitive market.

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

Building a sufficient number of charging stations is one of the most urgent priorities, globally, to make possible the projected and desired increases in EVs of all types. The buildout of this infrastructure in the Arab region is at an extremely early stage, but plans and investments are underway. Governments in the region should examine the current low levels of charging infrastructure for the degree of opportunity it might present to prioritize bidirectional-capable stations before significant sunk costs have been incurred for unidirectional technology.

11. 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

Aligning policy objectives and action plans across the transport, climate and environment, energy and public works sectors will help meet symbiotic targets for e-mobility, the energy transition and grid modernization. Identifying areas of mutual benefit and potential divergent points is a first step to ensuring closer alignment in policymaking. Subsequent steps should craft cross-sectoral policy options. Inter-ministerial committees and stakeholder coordination committees should be established in each country.

12. 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

Consumers will need to be persuaded as well as incentivized to adopt EVs, in general and also to participate in V2G. Addressing all these concerns and expectations will need early consumer engagement, with structured and extensive public awareness and public relations campaigns that include pilot projects to overcome such barriers.

B. Considering recommendations across Arab country groupings

The recommendations in this report are important in different ways and to different degrees to all Arab countries if they are to successfully make e-mobility part of their future at scale. Recognizing differences in economic, governance and other conditions throughout the region demands assessment of the feasibility and difficulty of implementing the recommendations for different countries and groupings of countries.

The framework for our assessment is institutional capacity, meaning the relative ability of Governments and societies to plan, organize and implement programmes to advance goals. Financial resources and the effectiveness of governance and programme implementation mechanisms are the two primary elements of institutional capacity in this assessment. Governance and programme implementation effectiveness have to do with the ability to enact policies, legislation and regulation, and the degree to which public and private sector entities in that country have the expertise, experience and depth to successfully manage programmes that follow from such policies and laws.

Countries are grouped into categories based on their capacity.

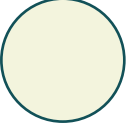
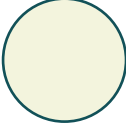
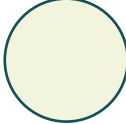
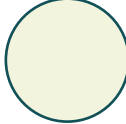
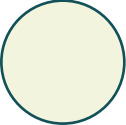
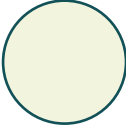
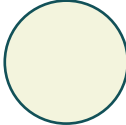
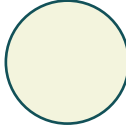
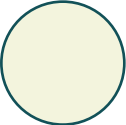
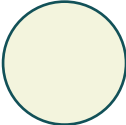
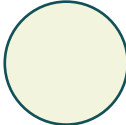
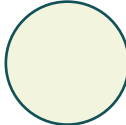
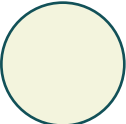
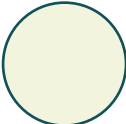
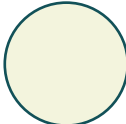
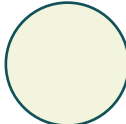
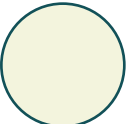
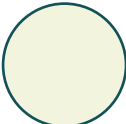
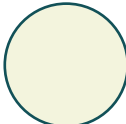
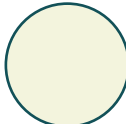
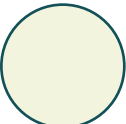
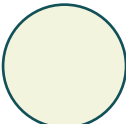
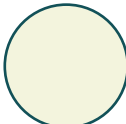
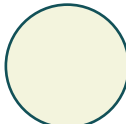
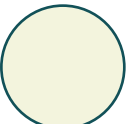
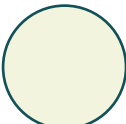
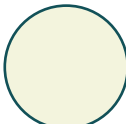
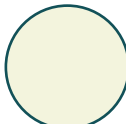
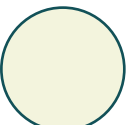
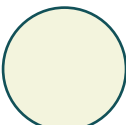
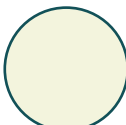
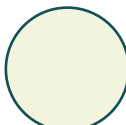
- Very high-capacity countries are those with very high income and highly effective governance. These countries can move expeditiously in passing new legislation and regulations, making the required investments and coordinating both domestic and international engagement in their countries to implement of all the recommendations provided in this report.
- High capacity countries are those with a combination of fairly high income and generally effective governance.

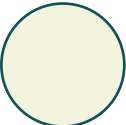
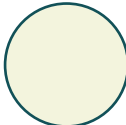
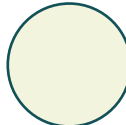
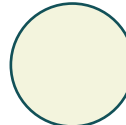
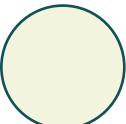
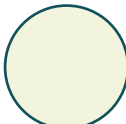
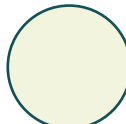
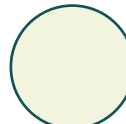
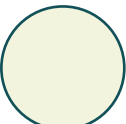
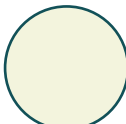
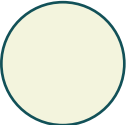
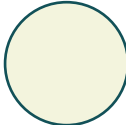
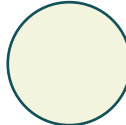
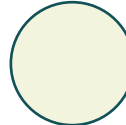
These countries can efficiently enact policies and laws, have sufficient resources to take on new priorities like those related to e-mobility and have effective engagement with domestic and international stakeholders to play necessary roles in implementing potentially all of the recommendations.

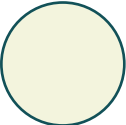
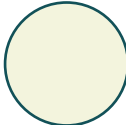
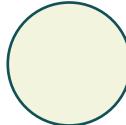
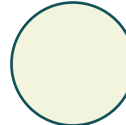
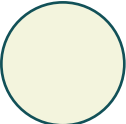
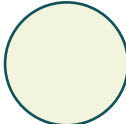
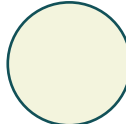
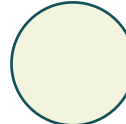
- Medium capacity countries are middle income countries that have to steward scarce resources carefully and that have more challenging governance environments. These countries are assessed as capable of undertaking most of these recommendations but may need to make trade-offs to ensure effective implementation and long-term sustainment of those they designate as the most urgent priorities.
- Low capacity countries are those in significant distress facing various conditions of state fragility, financial hardship, political uncertainty and/or challenges to popular support. For these countries only a relatively small number of recommendations are assessed as feasible for implementation, at least in the near to mid-term. For some very low capacity countries, none of the recommendations may be feasible until conditions improve considerably.

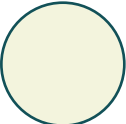
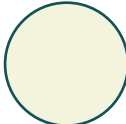
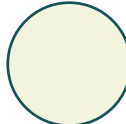
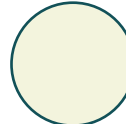
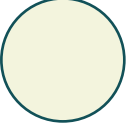
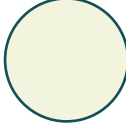
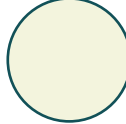
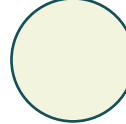
Implementation capacities and realities ultimately will have to be assessed on a country-by-country and recommendation-by-recommendation basis.

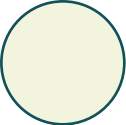
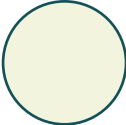
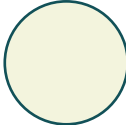
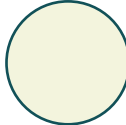
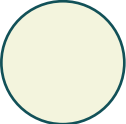
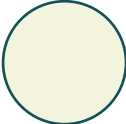
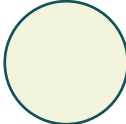
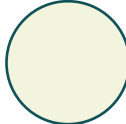
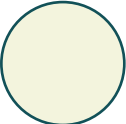
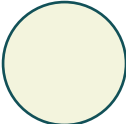
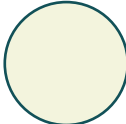
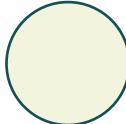
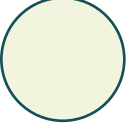
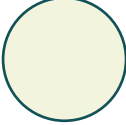
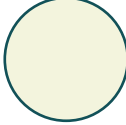
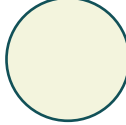
The matrix below provides the assessment of recommendations by country grouping. A circle represents assessed ability to implement.

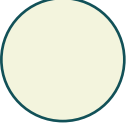
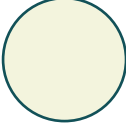
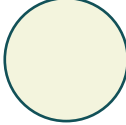
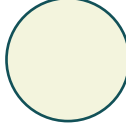
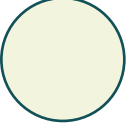
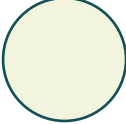
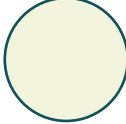
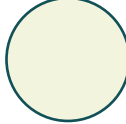
Policy, legislative and regulatory recommendations				
	Very high capacity countries	High capacity countries	Medium capacity countries	Low capacity countries
Develop a national sustainable urban mobility policy in each country of the Arab region, with capacity-building support as needed, to shift car drivers to more efficient and non-carbon producing forms of transportation.				
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.				
Set ICE vehicle phaseout deadline mandates in all Arab countries that include buses and other vehicles in the public transportation sector.				
Implement vehicle tax and vehicle insurance rationalization to promote electric two- and three-wheel vehicle sales and usage.				
Develop national governance and policy frameworks for MaaS that regulators at lower levels can align with for uniformity.				
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.				
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.				
Revise legal, policy and regulatory frameworks to restructure power markets, increase private participation and develop multi-producer and multi-buyer models.				
Eliminate the subsidies and implement time-of-use tariffs for electricity.				
In each Arab country, form an e-mobility working group with a designated “national champion” to coordinate and integrate transport, environment, energy, telecommunications and infrastructure policies for mutual benefit and promotion of mutually supportive renewable energy transition and e-mobility objectives.				

Standard-setting recommendations				
Recommendation	Very high capacity countries	High capacity countries	Medium capacity countries	Low capacity countries
Establish national and regional standards requiring interoperability in charging infrastructure, especially for charging points deployed for public transit systems.				
Emphasize mobility sector-relevant skills development in national and other education and training initiatives supporting economic diversification.				

Investment recommendations				
Recommendation	Very high capacity countries	High capacity countries	Medium capacity countries	Low capacity countries
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.				
Provide financial and other support to impel informal transport sector operators to adopt EVs and integrate with public transit MaaS systems.				

Prioritize creation of partner relationships with new and emerging EV manufacturers outside the Arab region.				
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.				
Provide financial support or policy incentives to encourage transport service providers including MaaS providers to adopt V2G-capable EV fleets and charge on certain schedules.				
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.				

Technical recommendations				
Recommendation	Very high capacity countries	High capacity countries	Medium capacity countries	Low capacity countries
Ensure that grid modernization and expansion efforts incorporate technologies and operational and other steps necessary to enable bidirectional charging of EVs.				
Prioritize the battery and charging station elements of the e-mobility supply chain as areas of focus for industry capability and capacity development in the region.				
Focus on developing EVs and related technologies that are tailored to distinctive needs and conditions of the Arab region as high-potential niche markets.	