



CASABLANCA_MOROCCO
UEMI_SOLUTIONS
2018

EV



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Wuppertal
Institut

UN HABITAT
FOR A BETTER URBAN FUTURE



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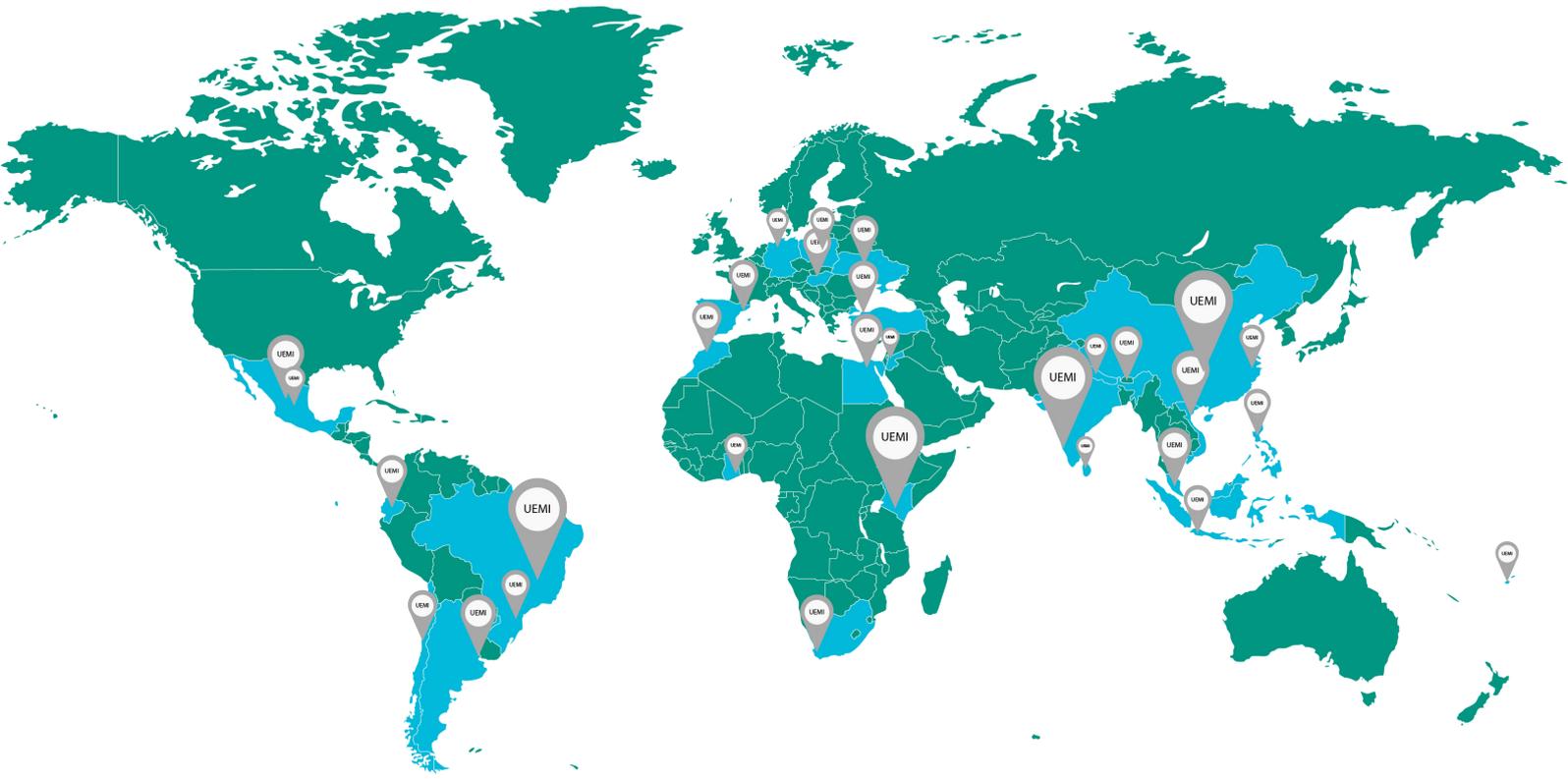
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SOLUTIONS



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UEMI SOLUTIONS COUNTRIES

KEY FACTS & FIGURES

GDP 101.4 USD

CASABLANCA

CITY

Country Statistics Morocco

Total Population: 34 million (2017)
 Population growth rate: 0.97% (2017)
 Urban population: 61.2% of total population (2017)
 Urbanised Surface: 227km²
 Urban Density: 17, 867inh/km²
 Rate of urbanisation: 1.92% annual rate of change
 GDP: 101.4 USD (2016)
 GDP per capita: 2,832.43 USD (2016)

Casablanca City

Population: 4.3 million people (2016), approximately 12% of total population
 GDP: 23% of country total GDP
 GDP growth rate: 14.3% (2015)
 Population density: 45 people/km²

NDC COMMIT MENT

Morocco has submitted its National Determined Contributions (NDCs) to the United Nations Framework Convention on Climate Change. The country aims to reduce its greenhouse gas emissions by 42% by 2030, compared to the business-as-usual projections.

Moreover, Morocco's NDCs oblige administrators to adjust their strategies and actions plans, so that they are able to:

- Provide 52% of installed electrical power from renewable sources, 20% of which will come from solar energy, 20% from wind energy and 12% from hydraulic energy by 2030.
- Achieve 15% energy savings by 2030 compared to current trends.
- Reduce energy consumption in buildings, industry and transport by 12% by 2020, and 15% by 2030.
- Achieve energy savings in the following sectors: a reduction by 48% for industry, 23% for transport, 19% for residential and 10% for services.
- Install an additional capacity of 3,900 MW of combined-cycle technology running on imported natural gas by 2030.
- Supply major industries with imported and re-gasified natural gas by pipelines.

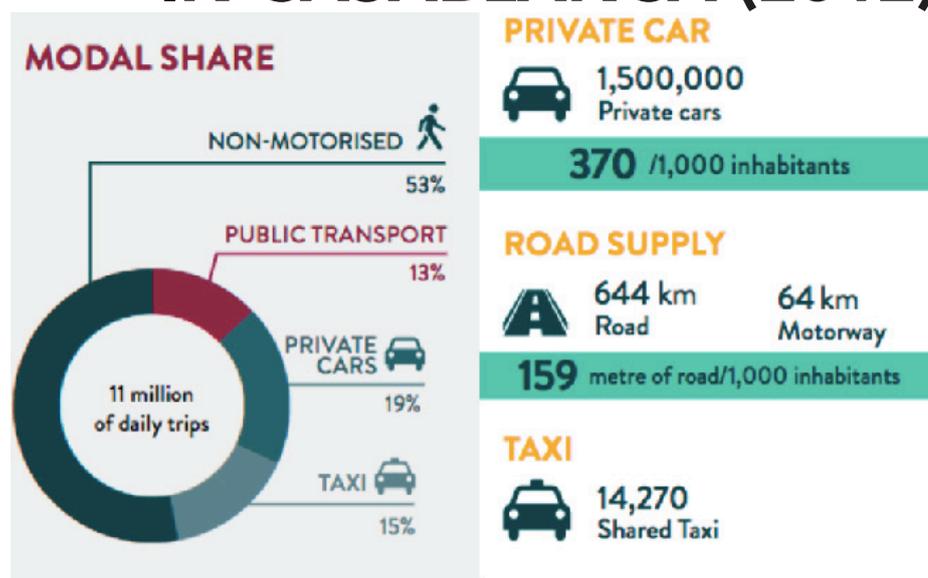
REDUCE ITS CO₂
BY 42% BY 2030

UEMI

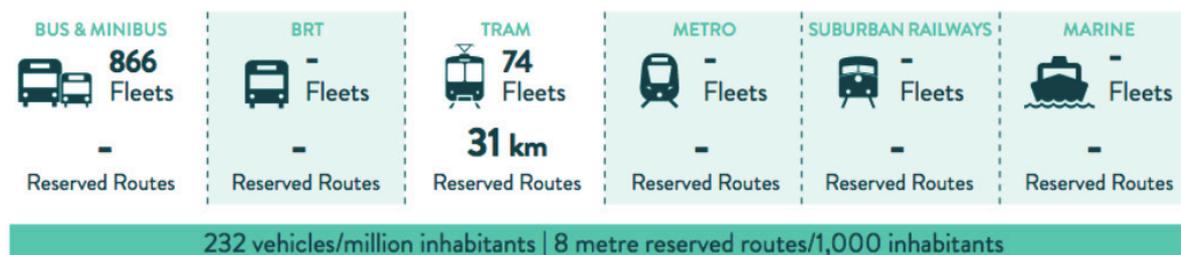


SOLUTIONS

MODAL SHARE IN CASABLANCA (2012)



PUBLIC TRANSPORT SUPPLY



Transportation Sector in Morocco

Transportation in Morocco represents 41% of the national total energy consumption, which contributes to 23% of the GHG emissions that the country produces. Petroleum that is imported entirely from outside Morocco is the primary energy source responsible for GHG emissions related to the transport sector in Morocco (Chachdi, Rahmouni, & Ghassane, 2017), since the country has no fossil fuels of its own. However, Morocco experiences over 3000 hours of sunlight every year, making it an attractive destination for renewable energy sources.

In 2005, only 15% of Casablanca's population used public transport, although the city's local authority intends to increase access to public transport to 21% by 2019. The public transport system will consist of BRT, tramways and bus networks, effectively connecting different parts of the city and aiming to reduce GHG emissions from the transport sector. Casablanca's municipality has planned to implement three tram lanes and four BRT lanes by the year 2022, with the intention of strengthening public transport. Casablanca also expects to reduce the usage of private cars in the city. This endeavour faces social challenges, as private ownership of a motor vehicle is highly regarded as a symbol of social status. Gender discrimination in Moroccan society could further hinder widespread use of non-motorised transport, such as bicycles, as women are not expected to use these forms of transportation.

In 2017, the World Bank approved a loan of EUR 172 million to the municipality of Casablanca, in the first sub-national lending operation in Morocco in two decades. The loan will allow the city to address many of its urban management challenges. Many of these challenges are a direct result of increased urbanisation, and pressures on institutions to provide services and adapt to cleaner environmentally-friendly practices.

COMPLEMENTARY MEASURES

The 2020 Development Strategy

The 2020 Development Strategy of Casablanca was published in 2014. This policy document outlines the framework for Casablanca's future developmental ambitions, which include addressing mobility issues. The document provides key targets and goals to support specific interventions and ensure the completion of projects. In particular, half of the earmarked budget is set aside for mobility programmes that aim to provide users with well-connected transport mobility systems. The Development Strategy policy document also lays the foundation for data collection, which will help benefit transportation issues. For example, detectors, which are deployed across the road networks near traffic lights, help collect data that contribute to aiding mobility improvement.

2020 DEVELOPMENT STRATEGY

Casa Open Data Portal

Across the city of Casablanca, users can also access the Casa Open Data Portal, which collects mostly static data about motor usage. Administrators use the data to help create and adapt a more comprehensive traffic-forecasting model for the city. With such data, they can better evaluate users' responses during events in the city, such as Ramadan, or during severe weather events.

Mobility budget/investments

In 2017, the city of Casablanca established a dedicated fund for financing urban mobility projects and initiatives. "The Fund for Public Transports" mainly supports the development of modern public transport systems in Casablanca; for example, the implementation of central control stations for traffic regulation and security. Casablanca has also earmarked a separate investment budget of EUR 3.4 million for mobility projects. These funds are specifically intended to help achieve the goals laid out in the 2020 Development Strategy of Casablanca. Some of the funds can be made available for innovators on request, but no specific funding is available for third-party innovation projects.

Current mobility challenge focus

Casablanca aims to increase integration among the different transportation services offered in the city. Casablanca's trams and buses are currently operated by two separate organisations. Furthermore, there are many different operators and fare systems across the city, with no integration between the payment methods.



ELECTRIC VEHICLE PROJECTS

- **Skytrain**

A project to review the feasibility of a skytrain in Casablanca is currently in its primary stages. The aim of project is to provide several electric monorail trains, in anticipation of the over-saturation of the tramway lines currently available in and planned for Casablanca. Plans for a skytrain include a 15-kilometre route suspended on beams, overlooking the metropolis' main arteries and crossings.

- **EV manufacturing hub**

In December 2017, a Chinese electric car manufacturer, BYD, became the third company (after Renault and Peugeot) to open an electric vehicle factory in Morocco. This development is part of Morocco's plan to have four major automaker plants by the end of 2021, and to have the capacity to produce one million electric vehicles by 2025. If these goals are met, Morocco could potentially be ranked among the top 15 vehicle-producing nations in the world (Middle East Eye , 2018). Economically, Morocco's market location is situated at the crossroads between Africa and Europe. BYD indicated that this market location comprised part of the rationale that compelled them to develop a factory in Morocco.

- **Electric charging stations**

In 2016, Morocco Vivo Energy installed a fast battery-charging station for EVs at a Shell Petroleum station between Casablanca and Marrakesh. Vivo Energy implemented the EV box to provide the first charging station network in Morocco (Morocco world news, 2016).

- **Integrated public transportation ticketing system**

By the year 2022, the city of Casablanca is aiming to develop 10 multi-modal transport interchanges in the city, in order to create a more integrated network system. The government plans to develop the public transport system to make it accessible to all residents. To that end, they established an integrated pricing and ticketing scheme for urban trips within Casablanca. Along with public transport, the local authority promotes other sustainable transport modes, e.g. cycling and walking. Another measure in making the planning process more inclusive is the involvement of residents in the consultation process. To ensure a well-functioning transport system, the Moroccan government also intends to improve the monitoring and evaluation process of the implemented measures.

- **Private Electric Vehicles (EV) in Casablanca**

While the electric vehicle is well-known in Morocco, sales of private EVs are constrained by budgetary considerations. In Morocco, ecological bonuses or scrapping premiums are non-existent for the buyer of a new electric car, hindering sales. In addition, EVs are considered to have higher maintenance costs, rendering them prohibitively expensive. Moreover, users of EVs are also constrained by the lack of available public charging terminals, as well as the time it takes to recharge the vehicle's battery (Chachdi, Rahmouni, & Ghassane, 2017).



CURRENT POLICY PROCESS

In 2011, the World Bank approved the Urban Transport Sector Development Policy Loan to Morocco. The objectives in approving the loan are to improve the governance of the urban transport sector, to increase the efficiency and supply of services and infrastructure, and to enhance the environmental and social sustainability of the sector within the country. The Moroccan governance authorities have made some concrete steps to improve the transportation policy in Morocco, as part of its integrated policy for developing different modes of transport. The Ministry of Equipment and Transport has undertaken several institutional reforms, namely, restructuring several services and facilities belonging to the transport sector; standardisation and organization of the sector alongside preparation of national and regional mobility plans; development of contract programs with maritime, aviation and construction operators; and establishment of the Moroccan Agency for the Development

of Logistics competitiveness (AMDL). The authorities are open to private sector investments in basic infrastructure, operation of facilities, and the provision of services. Two directorates within the Ministry of Equipment and Transport manage roads, road transport and security.

The state-owned company Autoroute du Maroc is responsible for the management and operation of the national road network. In 2015, the World Bank further approved the Program-for-Results Urban Transport Program project for Morocco. This program aims to strengthen the capacity of urban transport institutions to plan, implement, and monitor infrastructure and services, and to improve the service of urban transport in targeted areas. It will support the country partnership strategy (CPS) to promote competitive and inclusive growth by better linking citizens, including the poor, women, and people with limited mobility (World Bank, 2015).

Green Energy Strategy

Morocco is highly dependent on imports, especially petroleum, which impacts the country's balance of trade. The evolving international environmental policy landscape places a further burden on the country to improve its energy sector. Morocco has a goal to increase its share of energy to 52% by 2030, through its green energy strategy and sustainable development goals.

Tax benefits for eco-friendly car owners

In 2017, Morocco cancelled customs duties for hybrid and electric vehicles, introducing a 10% VAT tax reduction system for importers and distributors of eco-friendly cars (Jabrane, 2016).

National Energy Strategy

The national energy strategy emphasizes the importance of energy efficiency and suggests specific measures to be implemented to improved Morocco's energy mix. These include energy incentives in road transport, buildings and industry, as well as prescribing energy impact assessments and audits.



MEASURES

Measures introduced to improve EVs sector

Morocco is implementing a variety of measures to improve the Electric Vehicles sector. They intend to replace old vehicles and introduce compulsory annual technical inspections. Drivers of heavy vehicles will receive eco-driving training. Additionally, Morocco will introduce tax incentives to promote low fuel consumption vehicles, set emissions limit standards, and disseminate energy audits for commercial vehicles. Governance authorities will also promote EVs through public information and awareness campaigns. Barriers to EVs in Morocco

Barriers to EVs in Morocco

- Dependence on conventional energies

Morocco is highly dependent on conventional energies, with a recent import rate that exceeds 95%. The country's reliance on fossil fuels for its energy matrix contributes heavily to its GHG emissions, although it also has high potential to shift towards more sustainable and environmentally-friendly energy production sources in the form of solar energy and wind.

- Transport and logistics sector

Morocco's current fossil fuel dependent transport and logistics sector contributes approximately 4% to the GDP, or or EUR 3.6 billion. About one million people of the total working population of Morocco (4.7%) are employed in this sector (Rensma & Hamoumi, 2018).

- Cost of purchase and maintenance

Most of the EVs in the Moroccan market are more expensive than traditional cars. High maintenance cost of EVs also deter potential buyers.

- Organizational challenges

Morocco lacks an integrated approach for implementing alternative energy sources. The electricity sector is monopolized by ONEE, contributing to a lack of competition. Furthermore, the EVs sector suffers from a dearth of qualified technicians and skilled workers. The country is aiming to streamline government policy across multiple sectors.





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RESEARCH TRENDS