



وزارة الطاقة والثروة المعدنية  
المملكة الأردنية الهاشمية



The Embassy of the Kingdom of the Netherlands & the Ministry of Energy and Mineral Resources of Jordan

## *Electric Vehicles charging infrastructure*

*An online dialogue between Jordan and the Netherlands*

### Final Report

15.07.2021



*Qurato*

[Energy Transition Facility](#)

Financed by the Netherlands Ministry of Foreign Affairs - implemented by Dutch Enterprise Agency

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## General project information

Project Number	ETFP21002
Title	Electric Vehicles charging infrastructure <i>An online dialogue between Jordan and the Netherlands</i>
Partners	The Ministry of Energy and Mineral Resources of Jordan The Embassy of the Kingdom of the Netherlands
Location	Amman, Jordan - online
Purpose	<p>The Jordan government wants to develop a e-mobility roadmap, since e-mobility reduces greenhouse gas emissions and improves air quality. Therefore, the Embassy of the Kingdom of the Netherlands is working together with the Jordan Ministry of Energy and Mineral Resources to support the Electric Vehicle (EV) charging section of the roadmap. The Netherlands National Charging Agenda experience can help Jordan.</p> <p>The Netherlands Enterprise Agency carries out the Energy Transition Facility (ETF) on behalf of the Netherlands Ministry of Foreign Affairs. The ETF arranged 3 online sessions to share knowledge and discuss further cooperation between both countries for EV charging infrastructure.</p>
Duration	1 May 2021 to 31 of July 2021

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## Executive Summary

The Jordan government wants to develop an e-mobility roadmap, since e-mobility reduces greenhouse gas emissions and improves air quality. Therefore, the Embassy of the Kingdom of the Netherlands is working together with the Jordan Ministry of Energy and Mineral Resources to support the Electric Vehicle (EV) charging section of the roadmap. The Netherlands National Charging Agenda experience can help Jordan.

### Purpose of the project

The online sessions aim to contribute to the Jordan-Dutch cooperation on EV charging infrastructure. The sessions provide insights from experts that are used for **capacity building for MEMR, EMRC and Energy sector employees**, to benchmark with international developments and to provide a starting point for internal EV charging policy development. Focus is on addressing **the framework conditions and legislation** for a feasible business model for an EV charging infrastructure. Guidelines and incentives to accelerate the roll-out of electric vehicles and charging infrastructure will also be addressed, in line with the ambition by MEMR to make the transition to electric mobility.

### Activities

The Netherlands Enterprise Agency carries out the Energy Transition Facility (ETF) on behalf of the Netherlands Ministry of Foreign Affairs. The ETF arranged 3 online sessions for this initiative:

- 1) EV charging ecosystem introduction
- 2) Policy framework and incentives
- 3) Specifics for implementation and contracting

### Results

The following results have been delivered:

1. Capacity building for MEMR to EMRC and Energy sector employees
2. An increased understanding of the status of EV charging
3. Ingredients for developing a roadmap towards e-mobility

KPI's have been used to ensure a successful project outcome, such as the number of participants, pro-active engagement in discussions and a survey for evaluation.

### Lessons learned / conclusions / recommendations

Valuable insights have been gathered around an open market and ecosystem for EV charging, vision and strategy, incentives and taxation models, the involvement of private businesses (existing and new), implementation, contracting and rollout.

It is recommended that a vision and strategy will be developed and translated into an implementation roadmap. Also, it is useful to continue knowledge transfer on specific topics and look into forms of collaboration between public authorities and public-private partnerships.

## Introduction

**The Energy Transition Facility (ETF)** supports partner countries with their transition to a more sustainable energy supply. Projects are focused on collaboration at policy level. National governments can request the support of the ETF to acquire **Dutch expertise, technical assistance on energy transition**.

The Energy Transition Facility is open to the following countries: Egypt, Jordan, the Palestinian Territories, Lebanon, Algeria, Tunisia, Morocco, Mozambique and Tanzania. The following organizations or employees can apply:

- Governments and government partners in the countries concerned with the energy supply in their country;
- Dutch diplomats and local embassy staff based in MENA countries

The ETF is commissioned by the Netherlands Ministry of Foreign Affairs and implemented by the Netherlands Enterprise Agency (RVO.nl). It is scheduled until Q3 2021.

### Applicant

The Applicants for this assignment are the Embassy of the Kingdom of the Netherlands in Jordan (EKN-AMM), in cooperation with the Ministry of Energy and Mineral Resources ([MEMR](#)) in Jordan.

## Project Overview

### Purpose of the project

The online sessions aim to contribute to the Jordan-Dutch cooperation on EV charging infrastructure. The sessions provided insights from experts, aimed at **capacity building for MEMR, EMRC and Energy sector employees**, to benchmark with international developments and to provide a starting point for internal EV charging policy development. Focus is on addressing **the framework conditions and legislation** for a feasible business model for an EV charging infrastructure. Guidelines and incentives to accelerate the roll-out of electric vehicles and charging infrastructure will also be addressed, in line with the ambition of MEMR to make the transition to electric mobility.

The sessions facilitated experience and knowledge exchange on topics such as electric vehicles charging infrastructure systems and technology, market models, and related regulatory frameworks. To accelerate the roll-out of electric vehicles and charging infrastructure, knowledge and best practices about EV charging from the Netherlands (and Europe) were shared to stakeholders for:

- Development of an **EV charging ecosystem and market model**
- **Setting regulatory framework for a roll-out strategy**
- Development of a **public-private governance**
- Providing next steps for **EV charging financing** as part of the energy transition and climate goals

These subjects were illustrated with examples of related policy for EV charging from the Netherlands, relevant for the Jordanian context.

## Project Activities

### Activities

Three online sessions were arranged. Zoom has been chosen as the online platform of choice, and the Dutch embassy has arranged interpreters in order to provide a flawless bi-lingual dialogue between participants. The online session included the following topics:

#### 1) EV charging ecosystem introduction - June 9, 2021

- An overview of all roles and components, with examples of existing market models
- Discussion on the scope of work regarding different transport modalities
- Future developments and the impact on the different sectors

#### 2) Policy framework and incentives - June 15, 2021

- Understanding the key policy elements
- Translation of policy into specific financial and non-financial incentives as well as other measures.

#### 3) Specifics for implementation and contracting - June 22, 2021

- The next steps to start up adequate policy measures and incentives and which authorities are to be involved.

The high-level agenda per session consisted of:

- Introductions and contributions from officials from Jordan and the Netherlands
- Expert speaker on specific topics incl Q&A
- Break
- Expert speaker on specific topics incl Q&A
- Dialogue between participants, with contributions via the chat or video
- Summary, contribution from officials
- Closing

### **Participants**

The participants (average 20-25 per session) have been invited by MEMR from a wide range of disciplines, Jordanian authorities and institutions related to the field of e-Mobility, EV and charging infrastructure such as:

- MEMR (Oil & Natural Gas Directorate, Planning and Organizational Planning Directorate, Electricity & Rural Electrification Directorate, and Renewable Energy & Energy Efficiency Directorate), Energy and Minerals Regulatory Commission (EMRC) and the Jordan Renewable Energy and Energy Efficiency Fund (JREEEF).
- Ministry of Transport (MoT), Ministry of the Environment (MoEnv) and Greater Amman Municipality (GAM) and Land Transport Regulatory Commission.
- Electricity sector parties like electricity and distribution companies, such as Jordan Electricity Power Company (JEPCO), Electricity Distribution Company (EDCO), and IDCO.

Participating consultancies, knowledge institutions and sector organizations from the Netherlands have been:

- Netherlands Knowledge Platform for Public Charging Infrastructure (NKL) – National Charging infrastructure Agenda
- Dutch Organization for Electric Transport (DOET)
- The Netherlands enterprise agency (RVO)
- FIER Automotive consulting
- Metropole Region Amsterdam Electric (MRAe)
- Zero Emission Projects

Expert speakers were:

- Mr. Michel Bayings, [Dutch Organisation for Electric Transport](#), *E-mobility Consulting*
- Mr. Rob Kroon, *FIER Automotive*
- Mr. Pieter Looijestijn, *Senior Consultant and Project manager at Zero Emission Projects*

Valuable contributions to the sessions on vision and strategy, scope and context were made by:

- HE. Eng. Hala Adel Al-Zawati, *Minister of Energy and Mineral Resources, Jordan*
- HE. Dolf Hogewoning, *Ambassador of the Kingdom of the Netherlands to Jordan*
- Mr. Frederik Wisselink, *Energy Envoy at the Ministry of Economic Affairs & Climate Policy in the Netherlands*
- Eng. Amani Mohamed Al Azzam, *Secretary General of the Ministry of Energy and Mineral Resources*
- Eng. Shorouq Abed Gani, *Director of Planning & Organizational Development, Ministry of Energy and Mineral Resources*
- Mr. Essa Batarseh, *Economic Affairs and Trade Officer, Embassy Kingdom of the Netherlands*
- Mrs Sonja Munnix, *Advisor Netherlands Enterprise Agency*
- Eng Florentine Visser, *Advisor Netherlands Enterprise Agency*

The sessions were organized and moderated by Roland Ferwerda (Qurato and Director NKL)

## Project Results

### Outputs

The output for this project consisted of the 3 interactive sessions and this report.

Per session, a presentation from the expert speaker is being made available to all participants for further reflection and learning. These presentations have been added to this report in the appendix

### Outcomes

The desired outcome consisted of three main elements:

1. **Capacity building for MEMR to EMRC and Energy sector employees**, to benchmark with other countries and international developments by providing Dutch strategy, knowledge and expertise in the field of EV charging infrastructure.
2. **An increased understanding of the status of EV charging**, including options for legislation development in Jordan and potential forms of cooperation between public and private parties.
3. **Ingredients for developing a roadmap towards e-mobility** have been discussed, consisting of proposed priorities, activities, incentives, stakeholders and domains for electrification.

To measure these outcomes, a number of semi-quantitative and qualitative indicators (KPI's) have been used:

- The number of participants has been registered, with each session being followed by 15-25 participants from a wide range of public authorities (6 institutions)
- A survey has been designed and handed out: with 6 responses the overall satisfaction was very or excellent. See appendix
- Active contributions from participants have been encouraged and measured during the sessions, resulting in more than 10 different questions or statements per session by a diversity of participants, via chat or video
- Via local communication groups, feedback has been gathered, resulting in a very positive response regarding increased understanding and capability building
- Ingredients for a roadmap as discussed and suggested, have been described in the conclusion and recommendations.

## Conclusions

Considering the feedback as received from participants and from the Jordan authorities, this ETF project can be considered successful as it has met the desired outcome and the participant's expectations.

When considering the topics discussed in the sessions, the following conclusions can be made regarding the relevant topics and outcome of the sessions:



1. A basic understanding of the **EV charging ecosystem** is very helpful for insight on the stakeholders, the dynamics and the value chain. A continued investment should be made to inform more Jordan stakeholders and to **support the national dialogue** on ecosystem design for EV charging.
2. The group has expressed a desire to develop a clear overall **vision and strategy** for electric mobility and EV charging, and the critical success factors for the specific context of Jordan. Also, it was recognized that both the Energy domain as well as the Transport domain have a stake in this; an investment in formal collaboration between the two departments on the topic of EV charging is considered useful.
3. A need has been expressed to better understand how **private businesses** can be part of the EV charging ecosystem: how to incentivize them and what are the conditions to make this successful. Parameters for this have been described, such as a stable and long term investment horizon, a positive business case and clear definitions of public-private collaboration. Also, some worries have been addressed such as who will organize import and maintenance of EV's and EV charging stations. For this, it might be good to connect with Dutch EV charging organizations via DOET, that have extensive experience in supporting EV charging implementation in other countries.
4. There is a desire to understand how **existing private business models** in e.g. oil/gas and the electricity sector can play a role in the transition towards e-mobility, such as petrol stations and car sales companies. The move towards e-mobility can be perceived as a threat for some existing (oil/gas) businesses, leading to obstruction and negative sentiment. Also, in the electricity and transport domain there may be great opportunities for existing business to become involved, promote e-mobility and create new business models
5. Considering **incentives**, the expert speakers have demonstrated that:
  - a. Total cost of ownership for EV's and EV chargers is a relevant parameter to take into account, rather than just purchase cost. EV's and EV chargers have a good business case compared to petrol cars when considering TCO.
  - b. There are multiple options for non-financial incentives that may be applicable to the Jordan context, such as using priority lanes, parking priorities etc.
  - c. Some financial incentives may be needed in order to promote the transition
  - d. When considering financial incentives, choose closed systems, assuring caps in expenses and a measurable impact (e.g. taxi's)
  - e. After a while, electric vehicles can be taxed in a similar fashion to prevent huge impact on government budget
6. The energy transition provides opportunities to rethink **taxation models**:
  - a. When choosing tax incentives to promote e-mobility, such as a reduced customs tax or a reduced purchase tax for specific EV segments (e.g. taxi's), the Jordan government should pro-actively identify measures to limit the financial impact and develop an adequate and sustainable taxation model for electric vehicles.
  - b. As the cost of oil imports will also decrease with EV growth, and renewable electricity production will have increased, these will provide additional benefits for the Jordan government; it is therefore useful to consider the overall impact on the Jordan economy.
7. Several questions around **Smart Charging** have been asked: for better understanding, how to incentivize, how to use flexible pricing and how to embed this model in the current energy infrastructure:
  - a. This will become more relevant when volumes of EV's, charging stations and amount of renewable electricity will increase and result in a significant impact on grid capacity

- b. Apart from grid capacity, smart charging can also provide an interesting business case, e.g. providing cheaper electricity for charging when there is an abundance of solar energy that cannot otherwise be used.
- 8. Some worries have been expressed on **safety**: incidents, training fire brigades etc. Extensive experience and knowledge is available on this topic, which could help prepare the responsible institutions adequately.
- 9. Lastly, as a follow-up to the vision and strategy, specific **operational support** has been expressed on how to develop specific policies, incentives etc: which government entity is leading, what are specific examples, but also realistic estimations of the costs of EV charging stations (procurement, installation, maintenance).

## Lessons learned

Participants have learned about a number of important topics. An overview of what has been learned in the past sessions is as follows:

### Session 1:

- An overview of actors around EV charging and how they are collaborating
- Roles and responsibilities of the stakeholders
- Business and earnings models per stakeholder, and the potential value in future scenarios
- Business models for different transport modalities
- Different types of EV charging (fast/slow, public, semi-public, private) and different business cases (fast charging, destination charging, public charging, charging at work)
- Interoperability requirements and EV-Roaming

### Session 2:

- Types of policies and incentives for EV's and EV charging
- Overview of financial and non-financial incentives
- Comparisons of different policies and incentives for EV stimulation
- An understanding of Total Cost ownership (TCO) and comparisons between types of solutions
- Impact of incentives and tax measures on TCO

### Session 3:

- Drivers for public authorities regarding EV (charging)
- Understanding of the Trias Mobilica to improve air quality and mobility: balancing between 'clean mobility', 'less mobility' and 'modal shift' (e.g. from private cars towards public transport)
- Drivers of the energy/mobility transition
- Translating public goals in policy options (scalability, regional approach, interoperability, tariff management etc.)
- Understanding of the role of public authorities (central, regional, local)
- Understanding of public-private collaborations and partnerships
- Different contracting solutions and ingredients for contracting
- High level requirements for tendering and contracting
- Roll-out strategies, triggers and priorities
- Success factors for EV charging for EV drivers
- User information
- Funding and costs for rollout

## Recommendations and next steps

Based on the topics that were mentioned in the conclusion, the following next steps should be considered:

1. An overall plan and strategy should be developed, taking at least into account:
  - a. The vision on electric mobility, both from a transport and an energy perspective
  - b. The design of an open market for EV charging, driven by private business, with active support and a regulatory framework from the government
  - c. Specific business models and incentives packages
  - d. Budget and tax impact
  - e. Impact on electricity grid
  - f. Roll-out strategy (locations, contracting, operation etc.)
2. Pilots can be designed for specific target groups, as pilots and demonstrators, in order to learn, to convince and engage stakeholders, limit financial and organizational impact and
3. Continue knowledge transfer, on specific topics, such as:
  - a. Policy and incentive development
  - b. Smart charging business model and technical/policy impact
  - c. Safety aspects of EV charging
  - d. Guidelines and templates for developing a tender for a concession or permitting of charging stations
4. Invest in further collaboration between public authorities (Ministries, and central-regional), and in public-private partnerships.

The expected outcome of this should be that in 2 years, the Kingdom of Jordan has developed at least 2 small pilots for specific segments, with the involvement of critical stakeholders such as an electricity company, distribution company, gas station owner, car sales company etc. The government (Ministry of Energy and of Transport, together with the regulator) has developed a policy and regulatory framework with tailor-made incentives, that provides long-term trust for existing and new businesses to actively get involved in e-mobility. The financial impact for the government (short, middle and long term) have been defined.

A means of measurement has been developed that translates these initiatives to the original targets of this project, including a carbon reduction estimate, reduced oil import estimate.

## Key Performance Indicators

- 3 sessions have been executed
- Around 25 participants all together, from six governmental institutions
- 3 expert presentations have been delivered
- 1 report has been delivered

## **Appendices**

### **1. Deliverables**

**- Session Programmes**

**- Presentations**

3 session programmes and 3 expert presentations have been attached to this report.