Green Finance and Investment

OECD Clean Energy Investment Policy Review of Jordan

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Foreword

Scaling up investment in clean energy – especially in renewable power – is critical to successfully implement the 2015 Paris Agreement on climate change, while addressing many of the economic and social challenges of developing, emerging and developed countries. Key challenges for Jordan include: sustaining economic growth; improving energy security; reducing fossil-fuel consumption and imports; reducing fiscal pressure linked to costly support to fossil-fuel imports; and creating local jobs.

The OECD *Clean Energy Investment Policy Review of Jordan* provides analysis and suggestions to help policy makers strengthen the enabling conditions for investment in renewable power in Jordan, especially in grid-scale and distributed solar and wind energy.

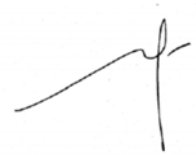
This report is a country-specific application of the OECD *Policy Guidance for Investment in Clean Energy Infrastructure.* The *Policy Guidance* is a non-prescriptive tool to help governments identify ways to mobilise private sector investment in clean energy infrastructure, especially in renewable power. The *Policy Guidance* benefited from significant inputs by the World Bank Group and the United Nations Development Programme, and was annexed to the Communiqué of G20 Finance Ministers and Central Bank Governors at their meeting on 10-11 October 2013. While it covers a broad spectrum of issues, the *Policy Guidance* does not follow a "one-size-fits-all" approach. It is thus being tailored to the specific circumstances and the needs of individual countries.

The OECD *Clean Energy Investment Policy Review of Jordan* was developed in co-operation with relevant stakeholders for renewable power in Jordan, including ministries, government agencies, private investors, business associations and donor agencies. It is part of the *Jordan Investment and Competitiveness Project* which is jointly implemented by the OECD and the World Bank Group, and funded by the MENA Transition Fund of the Deauville Partnership with Arab Countries in Transition.

The OECD is pleased to have facilitated the application of the *Policy Guidance* to the specific circumstances of Jordan, to help Jordanian policy

makers create a stable pipeline of bankable projects in renewable power, in consultation with private investors, civil society and donor agencies.

Pierre Poret, Director
OECD Directorate for Financial
and Enterprise Affairs



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This report has also benefitted from valuable written comments received from Jordanian officials, representatives from donor agencies and private stakeholders, including: Ruba Al-Zubi (CEO, EDAMA, Jordanian Business Association in Energy, Water and Environment; previously at USAID Jordan Competitiveness Program); Nadine Hammad (Associate Banker, EBRD); Samer Judeh (Chairman, JWPC, Jordan Wind Power Company); Hamza Al-Assad (EBRD); Wa'd Taweel (EBRD); Etienne Kechichian (Senior Private Sector Development Specialist, Climate Efficient Industries, World Bank Group); Lara Hayim (Analyst, Bloomberg New Energy Finance); and Omar Abu Eid (Delegation of the European Union to the Hashemite Kingdom of Jordan). The OECD Secretariat is also thankful to colleagues from the Ministry of Energy and Mineral Resources (MEMR), the Ministry of Environment (MoEnv), and the Ministry of Planning and International Cooperation (MoPIC), who have provided substantial contributions to the project, along with other agencies. They include notably: the Energy and Mineral Resources Regulatory Commission (EMRC); the National Electric Power Company (NEPCO); and Jordan Investment Commission (JIC).

This report also draws on recommendations gathered during a series of meetings held in Amman in May 2016 with key stakeholders, as well as a workshop organised by the OECD and the World Bank Group in Amman in March 2015 on renewable energy and energy efficiency. It also incorporates key points gathered through a series of individual interviews conducted from May 2015 through August 2016 by the OECD Secretariat. A large number of Jordanian officials, representatives from donor agencies, experts and private investors participated to interviews and meetings conducted by the Secretariat. They included: Raouf Dabbas (Senior Advisor, MoEnv); Samir Kilani (former Director, Green Economy Unit, MoEnv); Ziad Jebril Sabra (Minister Advisor, Renewable Energy Department, MEMR); Mohammad Dabbas (Ministers Advisor, MEMR); Wijdan Al Rabadi (Commissioner, EMRC); Basem Kanan (MOPIC); Zeina Toukan (Director of International Cooperation Directorate, MOPIC); Orouba Al Sabbagh (MOPIC); Bashar Al-Zubi (Director, Sector Skills Organization or SSO; former Senior Advisor, JIC); Allan Khalil (Coordinator of International Cooperation, NEPCO); Wissam Rabadi (Chief of Party, USAID Jordan Competitiveness Program); Shada El-Sharif (Director, Clean Technology, USAID Jordan Competitiveness Program); Ruba Al-Zubi (CEO, EDAMA); Nadine Hammad (Associate Banker, EBRD); Victoria Wickenden (Head, UK AID Jordan); Nasser Al-Hadi (Projects Officer, UK AID Jordan); Maher Matalka (Chairman, EDAMA) and Yara Abdel Samad (former CEO, EDAMA), Ennis Rimawi (Chairman, Millenium Energy Industries or MEI Solar); Samer Judeh (Chairman, Jordan Wind Power Company, JWPC); Muhannad Tarawneh (COO, Ma'an Development Company); Hanna Zaghloul (CEO,

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This report builds on the experience of the Secretariat of the Investment Committee, within the OECD Directorate for Financial and Enterprise Affairs, in helping countries improve their domestic investment environment for infrastructure investment, as well as on the experience of the Secretariat of WPCID, within the Environment Directorate, in providing policy recommendations relating to climate change mitigation policies and green infrastructure investment. This report draws on relevant OECD work and instruments, including: the *OECD Policy Framework for Investment (PFI*); the OECD *Investment Policy Review* of Jordan, which paved the way for Jordan's adherence to the OECD *Declaration on International Investment and Multilateral Enterprises* in November 2013; and the report *Renewable Energies in the Middle East and North Africa*. It also builds on key findings from the OECD *Jordan Assessment Report: Optimising the Incentives Framework for Renewable Power Infrastructure* (2014), which was developed in co-operation with Vivid Economics, under the Investment Security in the Mediterranean (ISMED) Support Programme. The *Jordan Assessment Report* proposed improvements to Jordan's existing framework for renewable power, based on three types of incentives (regulatory, financial and fiscal). This report – the OECD *Clean Energy Investment Policy Review of Jordan* – provides a more comprehensive assessment of Jordan's broader policy and regulatory framework for investment in renewable power, based on the *Policy Guidance for Investment in Clean Energy Infrastructure*.

Acronyms and abbreviations

AFD	Agence Française de Développement (French development agency)
CO2	carbon dioxide
c-Si	crystalline silicon
COP	Conference of the Parties
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
EMRC	Energy and Minerals Regulatory Commission
EPOC	Environment Policy Committee
FiT	feed-in tariff
GHG	greenhouse gas
IEA	International Energy Agency
IFI	international financial institution
INDC	Intended Nationally Determined Contributions
IRENA	International Renewable Energy Agency
IPP	independent power producer
JICA	Japan International Cooperation Agency
JOD	Jordanian dinar
JREEEF	Jordan Renewable Energy and Energy Efficiency Fund
kWh	kilowatt-hour
LCOE	levelised cost of electricity
LNG	liquefied natural gas
MEMR	Ministry of Energy and Mineral Resources

MoEnv	Ministry of Environment
MWh	megawatt hour
NEPCO	National Electric Power Company
OECD	Organisation for Economic Co-operation and Development
PPA	power purchase agreement
PV	photovoltaic
RD&D	research, development and demonstration
REC	renewable energy certificate
REEEL	Renewable Energy and Energy Efficiency Law
UNFCCC	United Nations Framework Convention on Climate Change
UNHCR	UN Refugee Agency
USD	US dollars
Wp	watts-peak
WPCID	Working Party on Climate, Investment and Development

Executive summary

Scaling up investment in renewable power can significantly contribute to addressing many of Jordan's crucial challenges. These include: sustaining economic growth; improving energy security and reducing fossil-fuel consumption and imports; and reducing fiscal pressure linked to costly support to fossil-fuel imports. Unlike some of its neighbours in the Middle East and North Africa (MENA) region, Jordan has few fossil-fuel resources of its own and imports around 96% of its total primary energy supply. Concerns over energy security and fossil-fuel imports dependency have intensified in Jordan due to political events in the region, including gas supply interruptions since 2011, and more recently, the rapid growth in energy demand caused by a large influx of more than one million refugees and asylum seekers, mostly from Syria and Iraq.

This report provides an assessment of Jordan's existing policy and regulatory framework for investment in renewable power. It also provides non-prescriptive policy suggestions and raises key issues for Jordanian policy makers to consider in order to scale up private investment in renewable power, in the areas of: investment policy; investment promotion and facilitation; competition policy; financial market policy; public governance; and other cross-cutting issues. The report reviews key elements of Jordan's policy framework for renewable-power investment, drawing from topics and themes addressed in the OECD *Policy Guidance for Investment in Clean Energy Infrastructure* (OECD, 2015a). This guidance is a non-prescriptive tool that assists governments in improving the domestic enabling environment for investment in renewable energy in the electricity sector.

Jordan's existing policy framework for investment in renewable power

Recognising the potential for renewable power to achieve its energy security, economic growth and environmental objectives, the Government of Jordan has developed a comprehensive set of laws, incentives, targets and regulations since 2010 to promote investment in renewable power, especially in solar photovoltaic (PV) and wind energy. Since establishing

its 2007 *National Energy Master Strategy*, Jordan has demonstrated leadership in the MENA region in terms of commitment to renewable-power deployment. It has introduced a target for renewable power: renewable energy is to reach 10% of the total primary energy mix by 2020. The *Renewable Energy and Energy Efficiency Law* (REEEL; passed as permanent law in 2012) is at the core of Jordan's renewable energy investment policy framework. Under the REEEL and associated by-laws, Jordan has implemented incentive schemes and procurement methods for awarding long-term power purchase agreements to grid-connected renewable-energy projects, including: a feed-in tariff (the first to be implemented in the Middle East, although it was mostly used in 2012); unsolicited expressions of interest from investors through a "direct submission proposal" procurement scheme; a competitive tender; and public procurement under Engineering, Procurement and Construction "turn-key" contracts. In 2014, Jordan established net metering and wheeling arrangements to encourage small and distributed renewable energy located on industrial, commercial or residential sites. In addition, the Government has set tax exemptions for renewable-energy systems and equipment from customs duties and sales tax. As a result, Jordan has one of the most advanced regulatory and policy frameworks for renewable-power investment in the MENA region. This report has, however, identified a few implementation areas that could usefully be strengthened.

Investment trends in renewable power

Investment in solar and wind power has significantly increased in Jordan since 2013. Jordan has strong potential for renewable power technologies, especially in grid-scale and distributed solar and wind energy. Largely driven by substantial policy support in recent years, new investment in solar PV and wind energy increased in Jordan in 2013-14, from no investment in 2012 to USD 478 million in 2014, before declining to USD 129 million in 2015 due to grid capacity constraints. The Government estimates that Jordan has attracted cumulative investments in solar and wind energy totalling USD 1.6 billion as of 2016, corresponding to a total capacity of 1 000 megawatts (MW), of which 500 MW will be connected to the grid by the end of 2016. Although the costs of PV and wind energy have declined since 2012, renewable power is still nascent in Jordan, at about 4% of the electricity generation mix as of mid-2016, compared to the targets of 7% by 2015 and 10% by 2020 set out in the *National Energy Strategy*. The vast majority of investments are in greenfield, grid-connected PV and wind-energy projects.

Strengthening Jordan's policy framework for renewable-power investment

Jordan has become an attractive country for renewable energy investment thanks to its robust policy framework. Nonetheless, a few outstanding issues might usefully be addressed through reforms and adjustments to existing policy planning, policies and regulations, thus enhancing effective implementation of Jordan's already robust legislative and regulatory framework.

This report highlights a few priorities for policy makers to consider in order to improve the enabling conditions for private investment in renewable power. It follows key policy areas identified by the *Policy Guidance for Investment in Clean Energy Infrastructure*. Within each policy area, key priorities that Jordanian policy makers could usefully consider include:

- **Investment policy:** streamlining the land acquisition and leasing process for renewable-power facilities.
- **Investment promotion and facilitation:** improving the transparency and enforceability of the unsolicited or direct proposal submission scheme; facilitating net metering and wheeling procedures for commercial, residential and industrial users; further phasing down support measures for the consumption of fossil fuels and increasing electricity tariffs for household consumers, while providing targeted subsidies to benefit the poorest households; and streamlining licensing and registration procedures.
- **Competition policy:** reforming Jordan's single-buyer model in the electricity sector.
- **Financial market policy:** increasing the participation from local Jordanian banks in the financing of renewable-power projects; using donor support to build capacity in order to access international climate finance for renewable-power projects in Jordan; and leveraging private sector finance for renewable-power projects, using public funds (such as the *Jordan Renewable Energy and Energy Efficiency Fund*) and donors' funding.
- **Public governance**: improving planning for future grid extension to connect planned and future renewable-power projects to the grid; and improving co-ordination between government officials, donor agencies, international financial institutions, project developers and local authorities.

Assessments and recommendations

Jordan faces key challenges and opportunities for scaling up investment in renewable power

To provide relevant context for the consideration of investment in renewable power in Jordan, this section provides a brief overview of Jordan's economic and energy trends. Jordan's economy has exhibited moderate economic growth for a number of years, but has struggled with energy security and supply challenges, as well as large current account and fiscal deficits leading to rising public debt. These imbalances are closely linked to the regional refugee crisis and the structure of Jordan's energy sector. Securing energy supply is a key priority for the energy sector, to cope with: high energy dependency; frequent exogenous shocks due to regional conflicts; high electricity costs; rapid growth in demand for electricity; a high ratio of energy imports to total imports; and high levels of support for fossil fuels. These challenges all point to the need to scale up investment in domestic energy supply, and especially in renewable power generation,[1] in order to sustaining economic growth, improving energy security and reducing budget pressure associated with fossil-fuel imports.

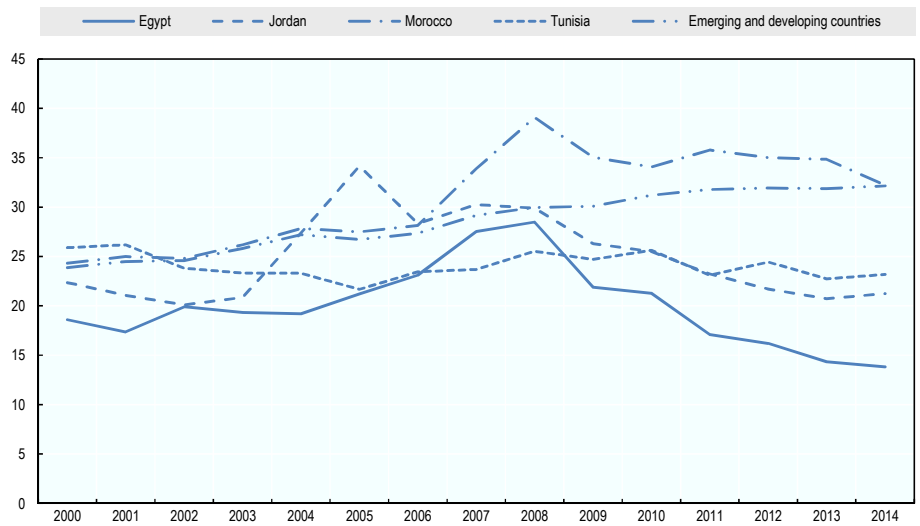
Sustaining economic growth

Securing energy supply and addressing regional instability remain the biggest challenges to achieving sustainable economic growth and development in Jordan (World Bank, 2016b; IMF, 2015a, e). Jordan experienced robust gross domestic product (GDP) growth of about 6.5% per year from 2000 to 2009, before declining to an estimated 2.6% in 2011; it remained relatively stable from 2011-15 (IMF, 2015e). In 2016, real GDP is expected to increase by 2.5-3%, partly thanks to low oil prices and increased confidence following the implementation of policies under the *Jordan Compact and Response Plan* (IMF, 2016). Jordan's GDP growth is projected to rebound to 3.3% on average over 2016-18 (World Bank, 2016b). Electricity demand is projected to continue to grow at a rate of 7.4% per annum and demand for primary energy at a rate of 5.5% between 2008 and 2020, both exceeding the projected GDP growth rate in the same period (MOPIC, 2013).

Aside from energy-supply issues and regional tensions, Jordan has a relatively open economy, well-developed infrastructure and close economic links with Gulf countries. The Jordanian Government has implemented a number of reforms since the 1990s, including a large privatisation programme (OECD, 2013e). As a result, foreign direct investment (FDI) inflows significantly increased from an average of 0.2% of GDP in the early 1990s to 10% of GDP during the period 2000-11. FDI inflows have since fallen back, partly due to regional tensions, which have also hindered tourism and worker remittances (OECD, 2015f). After peaking in 2006, FDI inflows declined until 2012, recovering slightly in 2013; and the stock of FDI as a percentage of GDP in Jordan has declined despite positive real GDP growth (OECD, 2015f). Since the 2008 global financial crisis and the rising regional tensions, total investment as a percentage of GDP has also been declining, at a relatively accentuated trend compared to other selected countries in the MENA region (Figure 1; OECD, 2015f). These capital inflows benefit primarily: the financial sector; extractive industries such as phosphate and potash; post and telecommunications; chemicals; the electricity sector; and real estate (OECD, 2015f, 2013a).

Figure 1. **Total investment in selected MENA[1] and emerging and developing countries**

(2000-14; % of GDP)



1. Egypt, Jordan, Morocco and Tunisia.

Source: International Monetary Fund (IMF) (2016), *World Economic Outlook Database*, Accessed 21 November 2016.

Improving energy security and reducing budget pressure

Unlike some of its neighbours in the Middle East and North Africa (MENA) region, Jordan has few fossil-fuel resources of its own and is a net energy importer. For the past ten years, Jordan has imported 96% of its energy supply, particularly crude oil and oil products from neighbouring countries such as Saudi Arabia and Iraq; natural gas from Iraq, Egypt and Qatar; and electricity from Egypt and Syria (REN21, 2015; OECD, 2013b; IEA, 2011). The share of energy imports as a percentage of GDP has increased in Jordan, from 7.5% in 2000 up to 16.2% in 2013 (IMF, 2015c).

Concerns over energy security and access to reliable energy sources have intensified in Jordan due to an increasing energy demand resulting from both GDP growth and a population growth rate of 2.8%, as well as the recent political events in the region. The country's high dependence on fossil-fuel imports also implies high vulnerability to external shocks. In 2010, more than 80% of Jordan's energy was imported via the Arab Gas Pipeline, which links Egypt to Jordan via an undersea pipeline (AGP; Clean Energy Pipeline, 2013; Henderson, 2015). Recurring interruptions of gas supply from Egypt, since the regional turmoil that started in 2011, have increased energy security concerns and prices. Reliance on natural gas imports from Egypt fell from 89% in 2009 to 17% in 2012 (Henderson, 2015). The energy shortage was compensated by imports of diesel oil and heavy fuel oil, which represented respectively 49% and 29% in 2012 of fossil fuels for electricity generation (Henderson, 2015). Recently, the large influx of more than one million refugees and asylum seekers, mostly from Syria and Iraq, i.e. about 20% of Jordan's current population, has been an exacerbating factor of concerns over energy security and access (estimates as of December 2015; UNHCR, 2015). Recent 2016 estimates in Jordan are close to 1.4 million refugees, including around 650,000 registered Syrian refugees as of May 2016 (BNEF, 2016; UNHCR, 2016).

Renewable electricity can help improving energy access and reducing energy costs associated with the arrival of refugees and asylum seekers. The Jordanian Government plans to install 300 solar-powered water pumps to reduce energy costs associated with water use[2], thanks to funding from the European Union (BNEF, 2016). Other planned initiatives to deploy renewable energy to address growing energy needs due to the flux of refugees include 1 000 rooftop solar panels and 20 000 sun-powered water heaters (BNEF, 2016). In addition, the state-owned electricity company and main off-taker, the National Electric Power Company (NEPCO), is working with Japan International Cooperation Agency (JICA) to provide electricity training for skilled refugees living in Zaatari Camp and working on the newly established electricity grid in Zaatari camp, including for solar

photovoltaic energy projects, in cooperation with the UN Refugee Agency (UNHCR) (Interview with NEPCO, 2016; JICA, 2016). Other projects supported by international financial institutions include for instance: a solar PV plant near Zaatari camp, funded by the German development bank KfW; and a EUR 30 million grant managed by EBRD to introduce solar PV panels in up to five pumping stations in Zaatari and other sites, in co-operation with the Water Authority of Jordan (WAJ), with the possibility to installed PV panels on-site).

Together with government measures supporting fossil-fuel consumption, Jordan's fossil-fuel use puts a significant burden on public finances. The country spends 40% of its government budget to cover its energy needs and Jordan's energy imports amount to approximately 20% of Jordan's GDP (World Bank, 2015a; OECD, 2014a). Largely driven by the cost of fossil-fuel support measures, the already high gross public debt (70% of GDP in 2011) is projected to increase further to 93% of GDP by the end of 2015 (World Bank, 2016a). Despite improvements in Jordan's trade balance in 2015, the current account deficit increased from 7.3% of GDP in 2014 to 8.9% in 2015, largely due to lower public transfers and weaker service exports (World Bank, 2016a).

In addition, gas supply shortages since 2011 have forced the National Electric Power Company (NEPCO) to import expensive diesel heavy fuel and diesel oil products, causing NEPCO to incur significant losses. In 2013, natural gas accounted for just 12% of Jordan's primary energy supply, down from 43% in 2010. As a result from increased diesel imports, the costs of electricity generation and distribution peaked to more than JOD 0.146 (EUR 0.155) per kilowatt-hours (kWh) in 2012 for NEPCO, though the average sales price was subsidised down to JOD 0.0636 per kWh (GIZ, 2014). The price difference was covered by NEPCO, causing the company to incur a loss of JOD 2.3 billion in 2012, amounting to 5% of GDP in 2011 (GIZ, 2014). Power generation costs went up even further after 2012, and NEPCO's losses went up to USD 6.9 billion in 2015. The fall in oil prices since 2014, however, has reduced NEPCO's losses, and led to expected savings of around 1.5% of GDP in 2015 (IMF, 2015d). The fiscal deficit was reduced to 3.6% of GDP in 2015, down from 9.3% in 2014, largely thanks to low transfers to NEPCO (as well as the Water Authority of Jordan) (World Bank, 2016b). NEPCO is currently preparing a debt management plan, with support from the World Bank Group to improve NEPCO's financial sustainability (Interview with NEPCO, 2016). In addition, NEPCO has signed in September 2016 a USD 10 billion landmark deal with Israel's Leviathan offshore gas field to supply natural gas in Jordan for the next 15 years (Financial Times, 2016).

By reducing fossil-fuel imports, scaling up investment in grid-scale and distributed renewable power in Jordan could enhance energy security and relieve budget pressure linked to subsidising the cost of imported energy supplies. Energy efficiency can also help achieve this goal, though these sectors are not discussed in this report. In addition, investment in distributed or small-scale renewable electricity generation can also facilitate cost-effective energy access in rural and remote areas, as renewable power is more decentralised than fossil-fuel based power generation and as off-grid renewable power systems typically compete with expensive oil or gas-powered back-up generators[3] (World Bank, 2015b; OECD, 2015a, b, 2014a). It is also important to remind that aside from oil or gas-powered back-up generators, oil has typically a small share in the electricity mix, so there is no clear correlation between oil prices and the attractiveness of renewable-power investment. Conversely, liquefied natural gas (LNG) contracts are linked to Brent prices worldwide; hence there is a clear correlation between the attractiveness of renewable power versus thermal power generation using natural gas (which constitutes the bulk of thermal power plants in Jordan and the country's baseload).

Adapting to climate change and associated co-benefits

Mobilising investment to deploy renewable power can also help the country adapt to climate change, reduce local air pollution and support water conservation. Although Jordan accounted for only 0.1% of global greenhouse gas (GHG) emissions in 2013, it has long recognised the need to adapt to climate-change impacts such as desertification and to address the challenge of water scarcity. Jordan signed the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 and ratified the Kyoto Protocol in 2003. In its Intended Nationally Determined Contribution (INDC) submitted to the UNFCCC in September 2015, and currently in the process of being updated, Jordan has pledged to reduce its GHG emissions by 14% until 2030; Jordan made an unconditional pledge to abate its GHG emissions by up to 1.5% by 2030 compared with a business-as-usual scenario (Hashemite Kingdom of Jordan, 2015; UNFCCC, 2015). Furthermore, environmental degradation could cost Jordan more than 2% of GDP per year, mainly due to local air pollution (1.2% of GDP) in urban areas, and inadequate water supply and hygiene (0.8% of GDP; Vivid Economics, 2013; World Bank 2010; Ministry of Environment, 2013). Declining labour productivity due to increased temperatures is expected to cost the country USD 1 billion per year by 2030. In addition, Jordan is already 90% desert and declining rainfall from climate change is likely to lead to even greater water scarcity and desertification (OECD, 2014a; Climate Parliament, 2013). Jordan ranks second from the bottom worldwide in terms of per-capita availability of water resources. Increasing renewable

power could help relieve Jordan's local air pollutions and water scarcity problem, since solar- and wind-power sources use far less water than do thermal power stations (OECD, 2014b).

Creating local jobs

Encouraging the deployment of renewable power can also support employment across the renewable value chains. The Jordanian Government has estimated that renewable energy and energy efficiency projects in Jordan could create around 2000-3000 jobs in remote and less developed areas in Jordan (MEMR, 2016a). The potential for Jordan to support domestic solar photovoltaic (PV) or wind-turbine manufacturing, without hampering downstream activities, is not considered within the scope of this report, but would deserve further analysis.

Jordan has a strong renewable power potential

Thanks to its location, Jordan has a strong potential for the deployment of renewable power technologies, especially in solar and wind energy. Jordan receives solar radiation of approximately 5-7 kWh per square meter of sunlight daily, and wind speeds in the country can be as high as 7.5 metres to 11.5 metres per second (m/s) (National Energy Research Centre, 2014; Climate Parliament, 2013). Typically, a good wind speed site averages 7 m/s and above (IEA, 2008). Solar PV energy in particular has a strong potential for contributing to Jordan's electricity mix, especially since Jordan consumes more energy in the summer than in the winter (GIZ, 2014).

Policy support is needed to help scale up investment in renewable power

Although some renewable power technologies, such as commercial-scale onshore wind power, are increasingly competitive with fossil fuels in certain countries, several barriers can still hamper both domestic and international investment in renewable power, as highlighted by the *Policy Guidance for Investment in Clean Energy Infrastructure* (OECD, 2015a).[4] Investment in those technologies still faces policy and market obstacles, along with country-specific impediments, technical challenges and lack of profitable investment opportunities, which can inhibit the development of renewable-power projects vis-à-vis incumbent fossil fuel-based infrastructure projects, including in Jordan. This is why policy support is critical to unlock private investment in renewable power.

Scope of the report

This report focuses on relevant policies and enabling domestic conditions for investment in grid-connected and distributed renewable power in Jordan, especially in solar PV and wind energy. It covers downstream power-generating activities, but not midstream manufacturing activities. This report also briefly reviews policies to support investment in solar water heating as well as zero-emission vehicles using renewable power. This report does not assess the potential to support investment in other relevant clean-energy sectors such as energy efficiency. Energy efficiency is particularly critical in Jordan, but policy options to support energy efficiency in Jordan are already addressed by other projects, such as the World Bank Group's *Energy Efficiency Investment Support Framework Project* (World Bank Group, 2014).

Assessment of Jordan's existing policy framework for investment in renewable power

Recognising the potential of renewable power to contribute to securing energy supply and creating new jobs and industries, the Government of Jordan has provided significant support to renewable power since 2010 (MEMR, 2016b). Legislation and institutions are in place to encourage private investment in renewable power. As a result, Jordan has one of the most advanced regulatory and policy frameworks for renewable investment in the MENA region (RCREEE, 2015; Clean Energy Pipeline, 2013).

Investment policy

There are few limitations on foreign investment in renewable power in Jordan, except in engineering and construction services. There are also restrictions for economy-wide wholesale and retail trade. Jordan, however, scores significantly higher than the average of OECD and non-OECD economies in the *OECD FDI Regulatory Restrictiveness Index,* which measures statutory restrictions on foreign direct investment. In addition, Jordan has considered attaching a local-content requirement to its net metering schemes for renewable power (OECD, 2014a; Ashurst Dubai, 2014).

Investment promotion and facilitation

Following the adoption of Jordan's *National Energy Master Strategy* (2007-20), Jordan has established several laws, regulations, targets and incentive schemes to encourage investment in renewable power, especially in solar PV and wind power. The *Renewable Energy and Energy Efficiency*

Law of 2012 (REEEL) is the main legislation to promote renewable energy investment in Jordan. Under the REEEL, Jordan has implemented several investment-incentive schemes, including: two methods for awarding long-term power purchase agreements (PPAs) to procure grid-scale renewable projects – a feed-in tariff set by the reference price list under a direct proposal scheme (DPS) in 2012 (the first to be implemented in the Middle East, although it was mostly used in 2012), and a public tender in 2014; a net metering scheme and wheeling arrangements in 2014 for distributed renewable energy located on industrial or residential sites; grid codes; and tax exemptions for renewable energy (and energy efficiency) systems and equipment from customs duties and sales tax, thanks to a by-law. Jordan reformed its support measures for the consumption of fossil fuels in 2008, (as well as for energy-efficiency systems and equipment) before suspending the reform in 2011 due to public protests. The reform eventually did take place, with floating prices amended monthly to reflect market prices, except for butane gas. Jordan has also established a one-stop shop to streamline licensing procedures for new investment projects. Additionally, the *Investment Law* No. 30 established the Jordan Investment Commission (JIC) in 2014 to promote investment in Jordan, especially in renewable energy.

Competition policy

Jordan is the only country in the MENA region that has implemented full (ownership) separation of generation, transmission, and distribution in the electricity sector, since the adoption of the 2003 *General Electricity Law*. The National Electric Power Company (NEPCO) owns and operates transmission lines, while three private companies own and operate the distribution networks, following recent privatisations. The *General Electricity Law* guarantees non-discriminatory access to the transmission lines. In addition, the *Renewable Energy and Energy Efficiency Law* requires NEPCO, the main off-taker in Jordan, to purchase electricity from renewable-power projects that are awarded power purchase agreements (PPAs), either through competitive tendering or direct proposal submissions. Jordan is the only country in the MENA region that requires the Government (through NEPCO) to cover the cost of grid connection for project developers.

Jordan's electricity grid can currently absorb only 500 MW more than the new capacity being tendered in the first tender round of renewable-power projects. Several rounds of procurement for solar and wind energy even had to be cancelled due to grid capacity limitations (two rounds for wind energy and one for solar energy). The new rounds for solar and wind energy are expected to be announced by end of 2016 or beginning of 2017. To address the challenge of planning for grid expansion, the *Grid Expansion*

and Reinforcement Plan released by NEPCO (also known as the "Green Corridor" project) is ongoing.

Financial market policy

Jordan launched in 2013 the *Renewable Energy and Energy Efficiency Fund* (JREEEF), to provide funding to renewable energy and energy efficiency projects in Jordan. Several donor agencies are also working with project developers and government agencies to facilitate access to financing for solar- and wind-power projects in Jordan.

Jordan has attracted renewable-power investment since 2013

Largely driven by increased policy support in the past few years, investment in renewable power[5] has significantly increased in Jordan in 2013-14, up from no investment in 2012, to USD 302 million in 2013 (in one completed wind-energy deal) and to USD 478 million in 2014 (in six completed solar energy deals; Figures 1.3 and 1.4; BNEF, 2016), in addition to six other solar projects that were signed and financed in 2014 (Interview with EBRD, 2016). It declined to 129 million in 2015 (two completed solar-power deals). Investment in renewable-power projects is cyclical as it follows government-run procurement rounds. The second procurement round was announced in 2015, for projects that were signed in 2016 or will be latest by early 2017, which explains why there was a decline in investment in 2015. According to the Government, Jordan has attracted solar and wind energy projects totalling USD 1.6 billion (Ghazal, 2016). The 58% increase in investment between 2013 and 2014 represented the largest growth rate in the MENA region behind Morocco. Most investments in Jordan are in new, grid-scale solar and wind power.

As of September 2016, the pipeline of renewable power deals in Jordan included 13 completed deals in solar and wind energy, and eight deals announced or under development (BNEF, 2016). Installed capacity in renewable power increased from 18.5 MW in 2014 to 130 MW as of May 2016 (RCREEE, 2015; Interview with NEPCO, 2016). The Government estimates that there will be 500 MW of renewable-power projects connected to the grid in Jordan by end of 2016, and that around 1 000 MW of wind and solar PV projects are under development in Jordan (Interview with NEPCO, 2016; MEMR, 2015a; Ghazal, 2016).

Key policy suggestions to strengthen Jordan's policy framework for renewables investment

Jordan has developed a comprehensive set of incentives, laws and regulations to support investment in renewable power, and demonstrated leadership in the MENA region in terms of policy support to the deployment of renewable energy in the power sector. Nonetheless, as in other attractive countries for renewable energy investment, a few outstanding issues could usefully be addressed in order to create a pipeline of bankable renewable projects in Jordan. This report highlights a few non-prescriptive suggestions for policy makers to consider in order to improving the domestic enabling conditions for private investment in renewable power. The Government could notably facilitate the effective implementation of existing regulations and incentives for renewable-power projects. This report follows key policy areas identified by the *Policy Guidance for Investment in Clean Energy Infrastructure*, including: investment policy; investment promotion and facilitation; competition policy; financial market policy; and public governance. Within each policy area, Jordanian policy makers could usefully consider non-prescriptive priority suggestions – highlighted in bold below–, as well as other suggestions:

Investment policy

- **Streamlining the land acquisition and land lease process,** under both the direct proposal submission and wheeling schemes. Suggestions include: creating a database of available government lands; facilitating land-acquisition and -leasing procedures through the creation of a central office; addressing any needs for land conversion ahead of new project development; limiting land speculation; and establishing a queuing system to better inform project developers of available lands.

- Reviewing restrictions to foreign ownership under the *Regulation on Non-Jordanian Investments*.

Investment promotion and facilitation

- **Improving the transparency and enforceability of the direct proposal submission scheme** for project developers and financial sponsors. This is particularly critical as delays and cancellation of rounds in the renewables projects' submissions to the MEMR have created policy uncertainty and increased transaction costs for investors and developers of renewable power in Jordan.

- **Facilitating net metering and wheeling procedures for commercial, residential and industrial users.** Key suggestions include: improving the transparency of the land selection process; easing requirements from distribution companies to qualify for the net metering and wheeling schemes; clarifying the use of pooling through the wheeling scheme, including procedures to set up a special purpose vehicle; adjusting the tariff structure for net metering and wheeling schemes, by reducing tariffs for large commercial and industrial consumers, in order to encourage the use of the net metering and wheeling schemes by larger distributed solar- or wind-energy systems; allowing zero-emission vehicle users to use the wheeling scheme to charge their vehicle using renewable power; and allowing wheeling users to sell their excess capacity to distribution companies.

- Reviewing the structure of existing fiscal incentives for renewable-power projects, including exemptions from sales tax and customs duties, to improve consistency, implementation and transparency.

- **Further phasing down support measures for the consumption of fossil fuels** and increasing electricity tariffs for household consumers, while providing targeted subsidies to benefit the poorest households.

- **Streamlining licensing and registration procedures.**

- Strengthening and institutionalising public-private dialogue around policy making.

- Facilitating the deployment of renewable-power projects in Aqaba Special Economic Zone.

Competition policy

- Introducing priority access and priority dispatch to increase the competitiveness of renewable-power projects.

- **Reforming Jordan's single-buyer model.** Currently, NEPCO is the only entity authorised to purchase electricity and sell it to distribution companies. The Government could consider further opening the power market to independent power producers by enabling the main electricity distributors to purchase renewable-based electricity directly from independent power producers,

including under the direct submission proposal and wheeling schemes.

- Greening public procurement procedures for public facilities.

Financial market policy

- **Scaling up the use of blended and structured finance for renewable-power projects,** in co-operation with donor agencies and international financial institutions, including through encouraging the use of: aggregated solar PV projects; loan guarantees; syndicated loans; and standardised project documents. For instance, the *Jordan Renewable Energy and Energy Efficiency Fund* (JREEEF) could make better use of market-based financial instruments such as loan guarantees to leverage private sector financing.

- **Increasing the participation from local banks** in Jordan to the financing of renewable-power projects, e.g. by leveraging funding from the JREEEF and international financial institutions (e.g. through syndicated loans).

- **Unlocking Jordan's access to international climate finance** (including the Green Climate Fund) for renewable-power projects. Suggestions include: increasing resources within the Ministry of Environment; creating a new unit for accessing international climate finance linked to the *High Level Green Economy Steering Committee* (HLGESC) or the *High Level Sustainable Development Committee* (HLSDC); and using donors' funding to build capacity within the Ministry of Environment.

- Better communicating to Jordanian consumers about preferential access to financing for small-scale and distributed renewables projects provided by a facility of the Central Bank of Jordan.

Public governance

- **Better planning for grid capacity extension to connect planned and future renewable-power projects to the grid.** In addition to Jordan's existing grid expansion plan (under the "Green Corridor" plan), additional suggestions include: monitoring actual and projected grid capacity at regular intervals to ensure that the grid can accommodate new capacity in renewable power; creating a public, transparent database on grid capacity for both transmission

and distribution across the country, to reduce transaction costs and delays associated with grid impact studies; and securing additional funding for new grid improvements and planning grid expansion projects ahead of opening new tender rounds for renewable projects.

- Mapping the geographical distribution of renewable energy resources across Jordan to identify which areas may require land adjustments to allow the deployment of renewable-power projects.

- **Improving co-ordination between public authorities, donor agencies, international financial institutions and renewables project developers**, through establishing an inter-departmental committee engaging key public and private stakeholders; and for donor agencies and other international financial institutions, ensuring sufficient buy-in from the Government when designing donor activities.

- Training government officials, engineers and local technicians about operations and maintenance of renewable-power projects.

Structure of the remainder of the report

Chapter 1 and Chapter 2 are structured around the key policy areas discussed in the OECD *Policy Guidance for Investment in Clean Energy Infrastructure*, i.e.: investment policy; investment promotion and facilitation; competition policy; financial market policy; public governance (including donor co-ordination); and other cross-cutting issues. Chapter 1 assesses the current policy framework for investment in renewable power generation, including key policy reforms implemented to date in Jordan to support such investment. It also reviews investment trends in renewable power generation. Chapter 1 includes in Annex A.1 an overview of existing renewable-power projects in Jordan, along with relevant activities of donor agencies and international financial institutions. Chapter 2 provides non-prescriptive policy suggestions for policy makers' consideration in Jordan, in order to strengthen the enabling conditions for scaling up private investment in renewable power in Jordan.

Notes

1. As well as in energy efficiency, which is critical but not discussed in the present report.

2. Water demand has risen 20% on average in Jordan since the afflux of refugees, and as high as 40% in the northern region where most of the refugees are camping.

3. Jordan has a high level of electricity access, with 99.5% of the population with access to electricity as of 2012.

4. Including: lack of strong and coherent climate policies (e.g. weak or non-existent carbon pricing or incentives to renewable investment); lack of a predictable and coherent policy and regulatory environment (e.g. cumbersome administrative procedures); market and regulatory rigidities that favour fossil-fuel incumbency in the electricity sector (e.g. restricted access to the grid for independent power producers (IPPs) of renewable power); high financing costs; and outstanding barriers to international trade and investment, e.g. local-content requirements in solar and wind energy (OECD, 2015a).

5. As defined by Bloomberg New Energy Finance, investment flows in renewable power include: biomass and waste-to-energy, geothermal, and wind generation projects over 1MW; hydroelectric power projects between 1MW and 50MW; wave and tidal energy projects; biofuel projects with a capacity of one million litres or more per year; and all solar projects, with those less than 1MW estimated separately and referred to as small-scale projects, or small distributed capacity.

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Chapter 1

Stocktaking of Jordan's policy framework for investment in renewable power

This chapter reviews Jordan's current policy and regulatory framework for investment in renewable power, including key policy reforms implemented to date to support such investment. The Government of Jordan has provided significant support to renewable power over the past decade. Jordan has put in place several laws, regulations, targets and incentive schemes to promote investment in renewable power, especially in solar PV and wind energy projects. This chapter also takes stock of increasing investment flows in renewable power in Jordan since 2013.

[1] The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Recognising the potential for renewable power to achieve energy security, economic growth and climate change objectives, the Government of Jordan has provided support to investment in renewable power since 2010. Jordan has a relatively favourable investment framework for renewable-power investment compared with its peers in the MENA region (Ernst & Young, 2016; RECREEE, 2015; REN21, 2015). According to Ernst & Young's 2016 *Renewable Energy Country Attractiveness Index*, Jordan's market outlook is characterised as "opportunistic", as Jordan manages to set "attractive ad hoc projects or investments given either limited absolute market size or relatively immature market to date" (Ernst & Young, 2016). The new 2015 *Arab Future Energy Index* (AFEX)[1] also demonstrates Jordan's progress: Jordan ranks second in the Arab region for renewable energy trends and third for energy efficiency (RCREEE, 2015). Legislation and institutions are in place to encourage private investment in renewable power, as discussed subsequently (REN21, 2016, 2015; RCREEE, 2015).

Investment policy

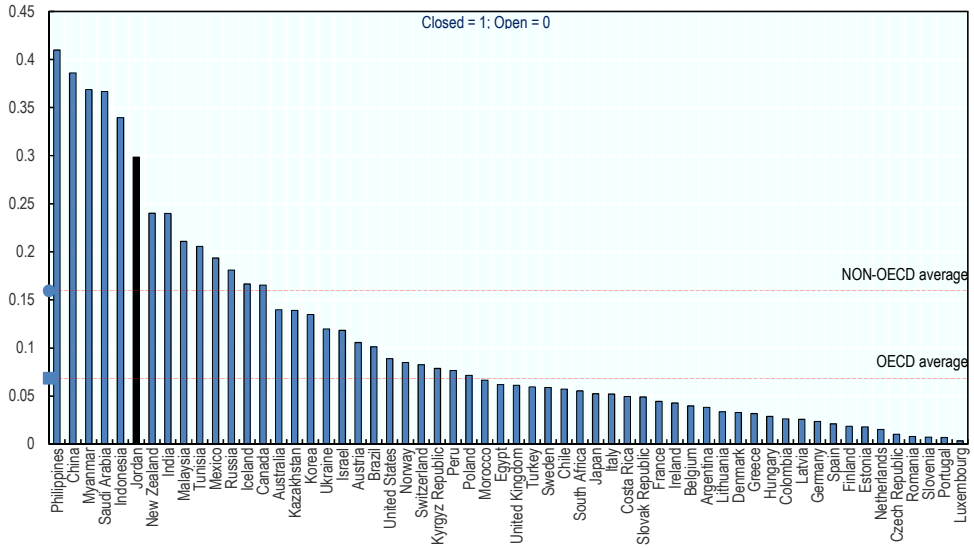
Jordan's *Investment Law* No. 30 was passed on 16 October 2014 to streamline and improve the transparency of the institutional and legal framework for both foreign and domestic investment in Jordan (OECD, 2015f). With the enactment of this new *Investment Law*, all related regulations were under revision in 2015. Under this new law, the Jordanian Investment Commission (JIC) is the government agency responsible for attracting investment including in renewable energy sector, facilitating investment procedures (including through establishing Special Economic Development Zones) and ensuring a stable investment policy environment. As part of the *Jordan Investment and Competitiveness Project,* the OECD has provided inputs to the Jordanian authorities on the draft and final *Investment Law*, including by discussing regulation revisions and implications of the *Investment Law* (OECD, 2015f).

Foreign ownership

There are very few limitations on foreign ownership of renewable-power facilities in Jordan. However, foreign ownership in engineering and construction services, as well as in wholesale and retail trade of any kind (including in energy services), is limited to 50% under the *Regulation on Non-Jordanian Investments* of 2000 (Regulation No. 54; SDC, 2000). There is an absence of a definition of investor nationality in the 2014 *Investment Law*, despite several references to the term "non-Jordanian investments" (OECD, 2015f). The recent amendment of the *Regulation on Non-Jordanian Investments* has introduced a clarification on the scope of some of the

restrictions to foreign investment, hence bringing further clarification about whether investors are covered or not by certain provisions in the laws and regulations.

Figure 1.1. **OECD FDI Regulatory Restrictiveness Index, 2015**



Notes: The *OECD FDI Regulatory Restrictiveness Index* covers only statutory measures discriminating against foreign investors (e.g. foreign equity limits, screening and approval procedures, restrictions on key foreign personnel and other operational measures). Other important aspects of an investment climate (e.g. the implementation of regulations and state monopolies among others) are not considered. All 34 OECD countries and 24 other non-OECD countries are covered, including all G20 member countries. Restrictions are evaluated on a 0 (open) to 1 (closed) scale. For more information on the methodology, please refer to Kalinova, B., A. Palerm and S. Thomsen (2010), "OECD's FDI Restrictiveness Index: 2010 Update", *http://dx.doi.org/10.1787/5km91p02zj7g-en*.

Source: OECD (2016a), FDI Regulatory Restrictiveness Index, in *OECD Factbook 2015-2016*, OECD Publishing, Paris. *http://dx.doi.org/10.1787/factbook-2015-table67-en*

Jordan's overall scoring under the *OECD FDI Regulatory Restrictiveness Index* is significantly higher than the average of OECD and non-OECD economies covered in this index (Figure 1.1; OECD, 2016a). This suggests that there are outstanding regulatory barriers to FDI in Jordan, despite encouraging legislative reforms conducted by Jordan, including the

new *Income Tax Law*, the 2014 *Investment Law* and the *Public Private Partnership Law* (as discussed subsequently). This is partly because of outstanding restrictions in the *Regulation on Non-Jordanian Investments*, despite the recent amendment (OECD, 2013c). Such restrictions include: a discriminatory minimum capital requirements for general business, which is relatively high compared to other non-OECD countries; and partial restrictions on foreign investment in several services sectors, such as transport services, distribution, real estate and some financial services (OECD, 2013c). The OECD has provided assistance to the Government in implementing Jordan's new *Investment Law* under the *Jordan Investment and Competitiveness Project.*

Investment treaties

Jordan has concluded more than 50 investment treaties with a wide range of advanced and emerging economies. Jordan's investment treaties typically offer covered foreign investors post-establishment protection and access to investor-state arbitration.

Properly designed investment treaties can play a constructive role in fostering international investment, including in renewable energy. Investment treaties can also have a significant impact on the government's right to regulate, in particular where arbitrators have broad discretion to interpret and thereby determine the scope of protection under relatively vague provisions (OECD, 2016b). The provisions found in Jordan's investment treaties are relatively vague, both regarding substantive provisions and provisions on investor-state dispute settlement.

While some countries have started to use investment treaties as a tool to liberalise investment flows by extending their application to those seeking to make investments, Jordan's treaties typically only cover established investors.

One of the policy goals advanced for investment treaties is the encouragement of inward investment. Claims that investment treaties actually lead to increased investment flows, however, have yet to be supported by conclusive evidence.

Investment promotion and facilitation

This section reviews key laws, policies and regulations for promoting and facilitating investment in renewable power in Jordan. The focus is on both grid-connected and distributed solar PV and wind energy.

Long-term goals and strategic planning

In 2007, the Jordan Ministry of Energy and Mineral Resources (MEMR) published the *National Master Energy Strategy* for 2007-20 – which was an update from the 2005 *National Energy Strategy* for 2005-20. The 2007-20 *National Master Energy Strategy* introduced targets for renewable power, which should reach 7% of the total primary energy mix by 2015, and 10% by 2020 (IEA, 2014b; EMRC, 2015a). The Government has also set several technology-specific targets: by 2020, the Government hopes to generate 1 800 megawatts (MW) of electricity through renewable-power projects, of which: around 1 000 MW will be from wind; 300-600 MW from solar thermal energy; and a 30% share from solar water heaters within renewables share (MEMR, 2016a). The Government has also established a targeted reduction by 20% in 2020 of energy consumed in 2007 (MEMR, 2016a).

In 2015, Jordan also launched *Jordan 2025*, a 10-year blueprint for economic and social development (MOPIC, 2016a, b). The *Jordan 2025* blueprint (also called "Jordan Vision 2025") provides a long-term vision for Jordan's economy for 2015-25, and includes more than 400 policies and measures to be implemented by the Government, private sector and civil society to support economic development in the next ten years, including in the cluster on renewable energy. This blueprint offers two scenarios: a baseline scenario, which assumes adopting some, and not all, of the priority initiatives identified by the blueprint; and a targeted scenario, which assumes adopting additional measures that would achieve high growth rates (MOPIC, 2016c). Encouraging investment in renewable energy is one of the desired outcomes of *Jordan 2025*, in order to ensure resource security and management in the energy sector. The targeted scenario includes several priority initiatives to achieve this goal, including: raising awareness about the incentives provided by the renewable energy and energy conservation law; improving the attractiveness of renewable electricity tariff by basing the purchase price on the cost of production; encouraging and supporting local industries to manufacture renewable energy components; implementing the power purchase agreements on the long-term for renewable energy producers; and activating the *Renewable Energy and Energy Efficiency Fund* (MOPIC, 2016b). This blueprint lists several renewable-energy targets, expressed as percentage of the contribution of renewable energy in the energy mix, including: 4% by 2017; 7% by 2021; and 11% by 2025, compared to 1.5% in the 2014 baseline.

The *Jordan 2025* blueprint was complemented by two studies: a scoping study commissioned by the United Nations Environment Programme (UNEP) in partnership with the Jordanian Ministry of Environment: *Towards a Green Economy in Jordan: A Scoping Study,* which identified six priority sectors Jordan's green economy: renewable energy; energy

efficiency; water; transport; waste management; tourism; and agriculture. (UNEP, 2011); and a *Study of mechanisms to incentivize the financial sector to scale up financing of green investment in Jordan – Hashemite Kingdom of Jordan* (Adam Smith International and Vivid Economics, 2011). The Ministry of Environment is also working with the Global Green Growth Institute (GGGI) to develop a *National Green Growth Plan* (2016 forthcoming) that is consistent with Jordan's national objectives of economic, social and environmental performance.

Table 1.1. **Renewable energy support policies in selected countries in the MENA region**

Country		Algeria	Bahrain	Egypt	Jordan	Kuwait	Lebanon	Libya	Morocco	Palestinian Authority	Tunisia	United Arab Emirates
Renewable-energy target		X	X	X	X	X	X	X	X	X	X	X
Incentive schemes and regulatory policies	Feed-in tariff or feed-in premium	X		X	X					X		
	Renewable portfolio standard or quota obligation											●
	Public tender	X		X	X	X			X			●
	Net metering			X	X		X		X	X	X	
Fiscal incentives and public financing	Capital subsidy	X		X							X	
	Investment or production tax credits											
	Reductions in sales, energy taxation, carbon price, value added tax, or other taxes			X	X		X	X		X	X	
	Energy production payment											●
	Public investment or loans	X	X		X		X		X		X	●

Notes: X: existing at national level (could also include measures at state or provincial level), ●: existing at state or provincial (but not national) level.

Source: Adapted from REN21 (2015).

Legislation to support renewable-power investment

Based on the recommendations of the *National Master Energy Strategy*, Jordan passed a *Renewable Energy and Energy Efficiency Law* (REEEL; Law No. 13) in 2012, which became permanent law in 2012 and was amended in 2014. Several by-laws and regulations related to investment incentives and financing schemes for renewable energy were also issued by the cabinet and the Energy and Minerals Regulatory Commission (EMRC), as discussed subsequently.[2] Jordan stands out in having implemented the largest number of renewable-power support policies in the Middle East, especially in renewable power (Table 1.1). The subsequent sections discuss the relevant incentive schemes for grid-scale, commercial-scale and small-scale renewable-power projects, including: direct proposal submission (DPS) scheme; competitive tendering; net-metering; electric power wheeling applications; and self-generation applications.

Incentive and procurement schemes for grid-scale renewable projects

Jordan was the first country in the Middle East region to successfully launch and finalise a public-procurement programme for solar energy (REN21, 2015). The *Renewable Energy and Energy Efficiency Law* of 2012 (REEEL) proposes two processes to procure grid-scale renewable-power projects over 5 MW, through awarding power purchase agreements (PPAs)[3]: direct proposal submission (DPS) scheme;[4] and competitive tendering. In 2012, the government allowed for the direct proposal submission of projects for generating electricity from renewable-power projects and also issued public tenders on a competitive basis for developing renewables projects at specific sites. The REEEL requires NEPCO to purchase electricity from the renewable-power projects that are awarded PPAs. Most projects are using a similar PPA template, which was developed based on the PPA used for the first renewable project in Jordan (Tafila wind), and is considered as a fair PPA for NEPCO, project developers and international financial institutions (IFIs), according to interviews with project developers, NEPCO and IFIs. NEPCO is also expected to guarantee grid access to each facility and carry the associated grid interconnection costs, as discussed subsequently.

Feed-in tariff

Under the REEEL, Jordan enacted in 2012 a feed-in tariff (FiT), set by the reference price list under the direct proposal submission scheme – the first FiT to be implemented in the Middle East. The Government evaluated bidders under a framework agreement that included a pre-determined feed-in tariff in a reference price list, according to different types of renewable

technologies (Interview with MEMR, 2015; OECD, 2014a; Ashurst Dubai, 2014). This reference price list is issued by the EMRC; it indicates the tariff at which the new power plants will sell electricity to the National Electric Power Company (NEPCO), under an electricity tariff cap (OECD, 2014a; IMF, 2015b; Chadbourne & Parke, 2013). The price ceiling was USD 0.14/kWh for solar PV, and USD 0.11/kWh for wind energy (ERC, 2012). Additionally, the REEEL included a 15% FiT bonus, conditional on a 100% local-content requirement, scheduled to end when 500 MW of renewable power capacity is connected to the grid (OECD, 2014a; ERC, 2013a, b). The priced-based feed-in tariff however was mostly used in 2012. With a few exceptions (such as the 10 MW Philadelphia solar project based in Mafraq or the 200 MW Masdar project), most projects have been procured since 2013 though quantity-based tenders, using competitive tendering or direct proposal submissions.

Direct proposal submission scheme

Jordan is the only country in the MENA region that authorises unsolicited or "direct proposal submissions" for utility supply by independent power producers (RCREEE, 2015). Under the direct proposal scheme, developers are responsible for acquiring the development assets by themselves and are guaranteed a tariff for the power they produce. The MEMR awards a Memorandum of Understanding (MoU) to successful proposals, which requires developers to acquire permits and undertake assessments. The criteria for direct proposal include details on the development plan including financing, preliminary design and the contribution of local inputs to the facility, supplies, operation and construction. For each round of direct proposal, the MEMR has nominated a priority area for development. Developers with deployment plans in these areas are given a priority. The bidder should also demonstrate that it has experience with similar renewable-energy facilities and include relevant documents. The electricity tariff proposed by the developer must be a fixed tariff within a pre-determined range according to government's reference price list. If the direct proposal submission and subsequent negotiations for a project agreement are successful, the project developer signs a PPA with NEPCO or with licenced private distribution companies.

The direct proposal submission scheme has been the most popular procurement method with independent power producers (IPPs) of renewable power in Jordan. It is expected to continue to deliver the majority of the country's renewable-power projects. Jordan has undertaken three rounds of direct proposal submissions so far. Table 1.2 summarises bidding rounds in solar and wind energy through direct proposal submissions:

- Through the first round, Jordan signed fourteen 20-year power-purchase agreements (PPAs), including: 12 solar PV projects, representing more than 200 MW of solar PV capacity; and two wind-power projects with around 400 MW in capacity, including the 117 MW wind farm in Tafila, the country's largest and first commercial-scale wind farm (REN21, 2015, 2016). The price ceiling (combining the reference price and bonus) of the first round was set at USD 0.17 per kWh for solar PV projects, and USD 0.12/kWh for wind farms (MEMR, 2014b).

- The second round, launched in 2013, was postponed and closed in December 2014. It primarily targeted solar PV projects in the North East region. It has generated significant interest from the private sector, with 84 expressions of interest, 43 shortlisted bidders, and 34 full technical and financial proposals received (MEMR, 2015b). Out of the bids, 24 bidders signed memorandum of understanding with the Ministry of Energy and Mineral Resources, ranging from USD 0.06 to USD 0.13 per kWh, with agreements to build on private lands. The four cheapest bids were each awarded 50 MW in new capacity, to produce four solar PV plants (MEMR, 2015b; Interview with JWPC, 2016). The second round for solar PV reached record-low bidding prices (REN21, 2016). By comparison, the average of the top four tariffs in the second tender round was more than 50% lower than the tariffs in the first round, demonstrating falling equipment costs in the solar PV industry in Jordan (PV Magazine, 2015d). The second round for wind power was cancelled, based on arguments of grid capacity constraints.

- The third round was launched in 2014 to focus on sites of 100MW of capacity for both solar and wind energy, but the round was cancelled later in 2014 due to grid capacity constraints.

Table 1.2. **Summary of request for proposal (RFP) rounds**

Request for Proposals round	Current status
Round 1 solar	There were 12 Round 1 projects approved with cumulative installed capacity of over 200MW. Four Round 1 projects approached financial close in May 2015. All projects were completed or near completion as of October 2016. Amongst those projects, the 10 MW Shamsuna project in Aqaba was the first solar project to reach commercial operations on 20 February 2016.
Round 1 wind	The Round 1 bidding process closed on 30 September 2014. There were four qualifying bids submitted. These proposals were for 250MW of wind projects.
Round 2 solar	MEMR approved Round 2 projects with a total capacity of 200MW in May 2015 in the North East of Jordan. The deadline for submitting proposals was extended several times. The latest deadline was set on 31 December 2014.
Round 2 wind	Round 2 for wind energy was launched in 2013. It was then cancelled by the MEMR.
Round 3 solar (and wind)	In February 2014, an invitation to submit expressions of interest was issued for wind and solar projects with total capacity of 100MW per project. Round 3 however was cancelled by the MEMR in September 2014 due to grid limitations.

Source: adapted from PwC (2015) and MEMR (2015).

Competitive tendering

In contrast to direct proposal scheme, the competitive tendering process has attracted less interest for renewable-power projects in Jordan. Only one competitive tendering process has been successfully launched, for the 90MW Fujeji wind farm project. Through competitive tendering process, the developer is invited to submit bids to develop the site identified by the MEMR. Once successful bids are awarded a PPA with NEPCO, the site can be developed on a "Build, Own and Operate" (BOO) basis (OECD 2014a; PwC, 2015; MEMR, 2015b).

Engineering, procurement and construction (EPC) contracts

In addition to the direct proposal submission scheme and competitive tendering for IPPs, "Engineering, Procurement and Construction (EPC)" turn-key contracts through competitive tendering are available to procure state-owned renewables projects. Under EPC turn-key contracts, also known as Build, Operate and Transfer (BOT) projects, companies are required to build the power plant (including but not limited to engineering and design, procurement, supply and transportation, construction and installation). The

Government then owns and operates the plant once it is completed and connected to the grid. So far, the Government has procured two EPC contracts for renewable power, both funded by the Gulf Cooperation Council: the 65-75 MW Ma'an wind project; and the 50-60 MW Quweirah solar PV project (EMRC, 2015b).

Net metering and wheeling arrangements

In 2014, Jordan implemented a net metering scheme for small-scale, distributed renewable energy on rooftops (MEMR, 2016a). The net metering scheme was established thanks to the 2012 amendments to the REEEL, under the provisions of the *Directive Governing the Sale of Electrical Energy Generated from Renewable Energy Systems* (EMRC, 2015a, b). The net-metering arrangements include fixed purchase prices for excess power from small renewable-power rooftop systems for industrial, commercial, agricultural or residential consumers, at retail value; this means that small scale consumers are allowed to produce their own electricity and sell their excess power to distribution companies at a fixed tariff (MEMR, 2016a). During 2013, 3.6 MW of capacity was signed up for net metering (EMRC, 2015a). Total installed capacity in PV rooftop systems using net metering reached 25 MW for solar PV installations in 2014, 30 MW at the end of August 2015 and 35 MW by April 2016, with another 30 MW in pending capacity from approved applications (EMRC, 2015a; MEMR, 2016a). Distributions companies have received more than 2000 applications as of April 2016 (MEMR, 2016a). As discussed subsequently, NEPCO is required to purchase electricity sold by residential and small-scale producers under the price agreed by the power purchase agreements.

In 2014, Jordan also implemented wheeling[5] arrangements under the provisions of the directive regulating the wheeling of electric power generated from renewable-energy sources for self-consumption, issued in 2013 and amended by the EMRC in 2015 (EMRC, 2015a). The wheeling scheme allows electricity power generated by renewable-energy systems, and delivered via transmission or distribution lines, to be used to offset the electric power consumed by the same residential, commercial or industrial consumer during a billing period (EMRC, 2015a). It enables the renewable facility to be located on a different location than the consumer premise, through agreements with distribution companies. Industrial, commercial and residential rooftops are often filled with satellites and water reserves. Thus establishing renewable facilities in different locations through the wheeling scheme can be an attractive alternative to net metering for industrial, commercial and residential users. The total monthly produced electricity of a given consumer using renewable-energy sources is subject to wheeling charges, under the provisions of the *Renewable Energy Electric Power*

Wheeling Directives. So far, several hospitals, hotels, banks, telecommunication companies have expressed an interest in building large-scale solar power stations based using the wheeling scheme (MEMR, 2016a).

Promotion of solar water heating

Under the *National Energy Strategy*, the Government seeks to increase the share of solar water heating from 13% of households in 2010 to 30% by 2020. Incentives to promote solar water heating in Jordan include sales tax and customs duty exemptions on solar water heaters. Since April 2013, Jordan has had a solar by-law in place that requires the installation of solar water heaters for every new multi-family building with more than 150 square meter of living space, for every new office building exceeding 100 square meter of floor space, as well as for each new public building with more than 250 square meters. In addition, Jordan's INDC included commitments to increased deployment of solar water heaters (Hashemite Kingdom of Jordan, 2015; UNFCCC, 2015; REN21, 2016).

Fiscal incentives

Two years after the adoption of the REEEL, the Parliament passed amendments in 2012, exempting renewable-energy systems and equipment from customs duties and sales tax. Development zones such as the Ma'an Development Area also offer fiscal incentives to investors in renewable energy. In addition, Jordan's *National Energy Strategy* seeks to provide investors with 100% exemption from income tax over 10 years, to encourage independent power producers to generate electricity using "Build, Own, Operate" (BOO) and "Build, Own, Transfer" (BOT) contracts.

Support measures for the consumption of fossil fuels and electricity tariffs

The Jordanian Government has made several attempts to reform its support measures for the consumption of fossil fuels and increase its electricity tariffs. They include the 2008 reform of fuel prices, and another plan announced in 2012.

In 2008, the Government implemented a three-stage programme to reduce the fiscal burden of support measures for the consumption of fossil fuels and offset NEPCO's losses. Prior to Jordan's 2008 reform of fuel prices, total government expenditure on fossil-fuel subsidies equalled its combined expenditures on health and education in 2008 (El-Katiri and Fattouh, 2015). The reform used an automatic fuel-adjustment mechanism, with prices adjusted each month to reflect international prices. The reform efforts resulted in a decline of fossil-fuel support, from 5.8% of GDP

in 2005, to 2.6% in 2006, and to 0.4% in 2010 (Fattouh and El-Katiri, 2012). In 2011, however, protests and social pressure due to rising living costs led the Government to reinstate support measures aimed at reducing fuel prices and to provisionally suspend the fuel-adjustment mechanism.

In November 2012, the Energy and Minerals Regulatory Commission (EMRC) announced a plan to gradually raise electricity tariffs for most market segments over four years, with an increase of up to 15% starting in 2015, in order to better reflect the cost of power generation and to reduce NEPCO's financial losses (OECD, 2014a; Bridle et al., 2014; Ghazal, 2014b). Effective January 2015, the Government decided to increase electricity tariffs for households who consume more than 600 kWh per month (from JOD 0.141/kWh to JOD 0.152/kWh) and for industrial users who consume more than 10 000 kWh/month (Ghazal, 2014b). Households with monthly consumption of less than 600 kWh per month, which represent the majority of households, were exempted from the electricity tariff increase until the end of 2017 (Ghazal, 2014b). In May 2015, however, the Government decided to reduce the 15% increase by half, in order to support economic growth, and appease considerable political protests in Amman streets and the Parliament (El-Katiri and Fattouh, 2015).

Carbon emissions targets and pricing

Jordan's (Intended) Nationally Determined Contribution, or (I)NDC, included a conditional pledge to reduce GHG emissions by a bulk of 14% until 2030, and an unconditional pledge to abate GHG emissions at up to 1.5%, compared with business-as-usual (Hashemite Kingdom of Jordan, 2015; UNFCCC, 2015). The country signed the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 and ratified it in 1993. Jordan acceded to the Kyoto Protocol as non-Annex-I country in 2003. Jordan has not introduced any mechanism to price carbon emissions explicitly, either through taxes or through an emissions trading system, though this is not identified as a priority for Jordan in the short- to medium-run.

Licensing procedures and environmental impact assessments

Several governmental institutions are involved in setting administrative and licensing procedures for renewable-energy projects, which can take as long as three years (Interview with project developers, 2015). In addition to an environmental permit, the main licence that a renewable project developer must obtain is a power-generation licence delivered by the Energy and Minerals Regulatory Commission (EMRC), entitled "Standard Generation Licenses Procedures for Renewable Generators Connected to the

Transmission System and Distribution System" (EMRC, 2015a). All renewable projects above 1 MW have to be licensed by the EMRC (Interview with EMRC, 2016). Certain projects below 5 MW can be exempted from the EMRC licensing requirement. Power purchase agreements (PPAs) mandate that renewable-power project developers issue all necessary licences and permits within an agreed time limit.

In addition, under Jordan's *Environmental Protection Law* No. 52 (2006), companies with activities that could affect the environment are subject to environmental impact assessments (EIAs). The Ministry of Environment is the main responsible authority for environmental protection in Jordan. The Royal Department for Environmental Protection inspects industrial facilities to check their compliance with environmental regulations (OECD, 2013a).

To streamline licensing procedures for all types of new investment projects in Jordan, the Government has established a one-stop-shop (OSS) Investment Window within the Jordan Investment Commission (JIC), as part of the 2014 *Investment Law*, with the authority to grant licences (OECD, 2015f). As mentioned previously, under the 2014 *Investment Law*, the JIC is the main government agency responsible for investment promotion, including in renewable energy. The JIC also requires each new free or special economic zone to undergo a Strategic Environmental Assessment. Experience suggests, however, that this one-stop-shop is currently not the main licensing agency for renewables projects, which have to go through EMRC for licensing.

Transmission and distribution grid codes

Jordan is also the only country in the MENA region that has established grid codes for distributed and utility-scale PV and wind-energy systems. There are, however, serious grid capacity issues that constrain the deployment of PV and wind power in Jordan, as discussed in Chapter 2.

Electric vehicles and renewable energy

Policies linking solar energy with electric vehicles have received little attention so far across country contexts, yet they represent a significant potential. The Jordanian Government has committed to build 3 000 solar-powered electric charging stations over the next ten years (REN21, 2016; Abou-Ragheb, 2015). The Ministry of Environment (MoEnv), the Ministry of Energy and Mineral Resources (MEMR) and the Energy and Minerals Regulatory Commission (EMRC) are working together to develop a new regulation to encourage the use of zero-emission vehicles' charging stations that are based on renewable energy. The Royal Court has exempted all

electric vehicles that are based on zero-emission electricity from sales tax and custom duties (Jordan Times, 2015). In addition, in June 2016, the car manufacturer Nissan signed a Memorandum of Understanding (MoU) with the Greater Amman Municipality in Jordan to provide the Kingdom with 100 Nissan LEAF and Nissan e-NV200 electric vehicles (Saudi Gazette, 2016).

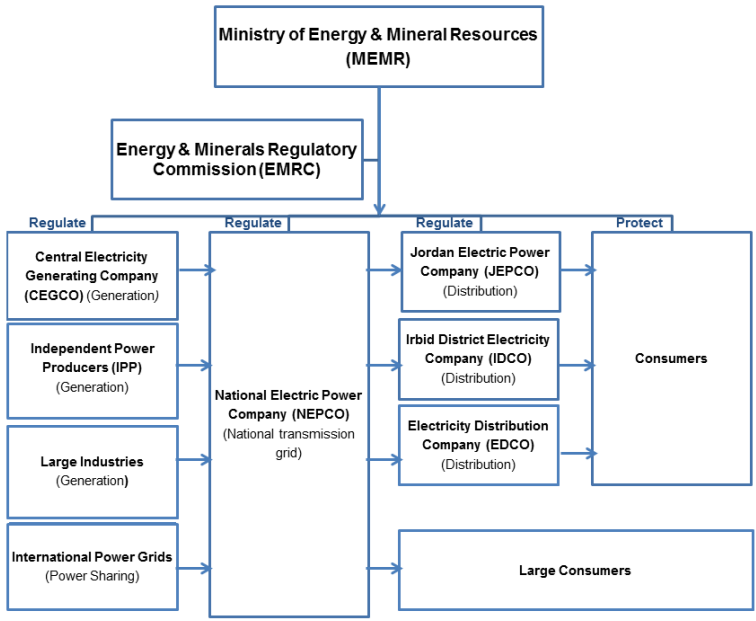
Competition policy

Electricity market structure

Jordan is the only country in the MENA region that has implemented structural separation of generation, transmission, and distribution in the electricity sector (full ownership unbundling), a process that started with the adoption of the 2003 *General Electricity Law*. The public utility and main off-taker, NEPCO, overseen by the Government and the electricity regulator (EMRC), owns and operates transmission lines and acts as single buyer, purchasing electricity from different generators and selling it to distribution companies (Figure 1.3).[6]

In the past decade, the Government has privatised several power companies in Jordan, to open the power sector to foreign and domestic investors. In 2007, the Government privatised the Central Electricity Generating Company (CEGCO) and the Irbid District Electricity Company (IDECO); and in 2008 it privatised the Electricity Distribution Company (EDCO). Altogether, three private companies own and operate the distribution networks (Figure 1.2). Privately owned companies now produce around 70% of Jordan's electricity according to recent estimates (RCREEE, 2015). Jordan currently has four independent power producers (IPPs), which operate 40% of the country's total power-generating capacity. The government plans to approve the participation of new IPPs to generate electricity in coming years, in order to enhancing competition in electricity generation and the quality of services offered to consumers. In addition, private companies are involved in distribution, including the EDCO.

Figure 1.2. **The electricity sector in Jordan**



Source: Adapted from GIZ (2014); CEGCO (2014).

Grid connection costs and grid access

Jordan is the only country in the MENA region that requires the Government to cover the cost of grid connection for project developers of renewable-power projects, although sometimes NEPCO can ask project developers to share the grid connection cost (Interview with NEPCO, 2016; MEMR, 2015a, 2013). Project developers, in turn, are responsible for building the high voltage terminals that will be connected to the grid by NEPCO.

In addition, the *General Electricity Law* guarantees non-discriminatory access to transmission lines by NEPCO. Connection to the grid is provided for in the Power Purchase Agreement (PPA), under Standard Transmission Connection Agreements, which were approved by EMRC Council. No specific consent or permit is required for grid connection, other than the connection agreement which is entered into simultaneously with the PPA. Jordan is the country in the MENA region with the most preferential grid access conditions for renewable-power projects, along with Algeria, according to the *Arab Future Energy Index* 2015 (RCREEE, 2015).

Financial market policy

This section briefly reviews existing funds, programmes and financial instruments to facilitate access to financing for renewable-power projects in Jordan. This report does not review broader policy reforms to strengthen Jordan's domestic financial market for renewables investment.

In 2013, Jordan launched the *Renewable Energy and Energy Efficiency Fund* (JREEEF) to support the deployment of renewable energy (and energy efficiency) in Jordan, by providing support at each stage of development, including: demand for renewable energy (and energy efficiency); public awareness and training; early stage project preparation; access to credit; cost of financing; and access to equity financing (MEMR, 2016a, 2015b). The Fund was established by the REEEL and under the MEMR's umbrella. The JREEEF is mainly capitalised by domestic funds and receives donations from international financial institutions including the Gulf Co-operation Council. The JREEEF recently announced it would disburse JOD 25 million to provide financial and technical assistance to renewable-energy projects through to 2018 (Venture Magazine, 2015). The JREEEF launched a tender in June 2015 to fit homes with solar PV systems. Eight agreements were subsequently signed to provide 600 homes in northern Jordan with solar PV systems. Renewable-power projects approved for 2015 implementation included: a household solar PV pilot project in North Jordan; and a household solar water heating project (MEMR, 2016a). The Government expects 60 000 solar water heaters and 20 000 solar PV systems to be installed between 2015 and 2018, thanks to support from the JREEEF (MEMR, 2016a).

The Central Bank of Jordan has created a facility to subsidise small-scale and distributed renewable energy (and energy efficiency) projects through local banks. The facility allows banks to use money allocated to the energy sector with subsidised interest rates for projects implemented by the JREEEF. The facility provides up to 4 million JOD for 10 years, with fixed interest rates that are quite low and competitive by local market standards (around 2.5% in cost of financing, capped at 6.5% in JOD). Consumers setting renewable facilities or solar panels on their rooftops through the net metering or wheeling schemes have accessed to preferential financing offered by the Central Bank's facility.

Other initiatives that offer capital subsidies for qualifying renewable-power projects include the Jordan Chamber of Industry's Factories Support Program, which provides a non-refundable capital subsidy to small industrial enterprises to install solar PV or solar water heaters, with a local-content incentive (up to 35% of foreign product costs, and up to 50% of domestic product costs; RCREEE, 2015). Additionally, the Governorates

Development Fund of Jordan Enterprise Development Corporation (JEDCO) supports start-up companies by allowing up to 80% of equity in their renewables projects (RCREEE, 2015). Gulf countries also provide grants to renewable-power projects in Jordan.

Multilateral development banks and bilateral donor agencies are critical contributors to financing for renewable-power projects in Jordan, through syndicated loans to help attract commercial debt. This is partly because of the low participation of local banks in renewable projects' financing (as discussed in Chapter 2), as well as the lower sovereign credit ratings of Jordan, due to the absence of fossil-fuel reserves in Jordan, compared to other countries in the MENA region (Clean Energy Pipeline, 2013). Jordan has had a credit rating of BB- from Standard & Poor's since 2013. Key donor agencies and international financial institutions for renewable power in Jordan include notably: the United States Agency for International Development (USAID), especially through its Jordan Competitiveness Program (JCP), which provides substantial support to the Government, e.g. to prepare and design regulations or to launch pilot projects; the European Union (EU); as well as the European Investment Bank (EIB); and the European Bank for Reconstruction and Development (EBRD), which has supported renewables project financing through syndicated loans, and has a facility in four MENA countries, including Jordan, to finance private to private projects through grants to cover due diligence, and gap analysis on the domestic regulatory frameworks; the French Development Agency (AFD); Japan International Co-operation Agency (JICA); and Gulf countries foundations. Table A.1.1 in Annex A.1 summarises relevant donor activities in Jordan.

Public governance

Planning for grid extension

The grid's current capacity is around 3 200-4 000 MW and can absorb only 500 MW more than added during the first round of renewable tendering projects (CleanTechnica, 2015). To address this challenge, NEPCO has released a *Grid Expansion and Reinforcement Plan*, also known as the "Green Corridor" plan, with support from the European Investment Bank (EIB) and the French development agency (AFD). This plan aims at developing a new high voltage electricity line connecting the northern to the southern parts of the country, and upgrading existing grid lines, in order to support the penetration of additional renewable power in the grid (Interview with NEPCO, 2016; IMF, 2015c; MEMR, 2015a; CleanTechnica, 2015). Initially planned in 2015, the project should be operational by the end of 2018. The Government estimated that around EUR 150 million were needed

to improve the grid, in order to transmit power from the South (where most solar PV plants will be concentrated) to Amman and the North (where energy demand is most significant). The investment would be equivalent to 0.5% of GDP and spread over 2014-16. Funding has been secured and bids for tender were issued in 2016.[7] As of 15 September 2016, 38 international firms have qualified to submit bids for the Green Corridor project, to increase the country's national grid capacity by an additional 1 GW (Tenders Info, 2016).

The *Electricity Law* No. 64 (2002) created an independent regulator, the Electricity Regulatory Commission (ERC) which established a new tariff framework. In 2014, Jordan established a new energy regulator, the Energy and Minerals Regulatory Commission (EMRC), which combines in one body the pre-existing regulatory functions of the Jordan ERC and the National Resource Authority (RCREEE, 2015). The EMRC is linked to the Ministry of Energy and Mineral Resources (MEMR), with an independent decision making process, e.g. on licensing procedures.

Other policies and cross-cutting issues

Public-private partnerships (PPPs)

Jordan has adopted the *Public-Private Partnership Law* No. 31 ("PPP Law") in 2014 to attract appropriate technical and financial partners through a competitive tendering process and implement PPP projects in all sectors of the economy, including in renewable power. Previously, the Regulation No. 80 of 2008 on *Implementing Privatization Transactions* ("Privatization Regulation"[8]) provided various mechanisms for privatisation, but did not address specifically PPPs (Sawalha, 2015). In contrast, the PPP Law of 2014 was implemented to codify project procurement using a PPP, including tender and bidding process applicable to PPPs, as well as rules and regulations of PPP projects (Sawalha, 2015). The PPP Law focuses on: identifying infrastructure sectors open to private participation; indicating the agencies responsible for authorising private projects or contracts; clarifying rules regarding contract amendments and termination; enabling competitive bidding and other procurement-related provisions; and defining the availability of dispute settlement including international arbitration (Sawalha, 2015). The PPP Law also governs construction of public infrastructure; it encourages the private sector to invest alongside the Government and extend funding for feasible public projects. This is a major shift from the 2008 Privatization Regulation, which was limited to traditional concessions and the BOT form of PPP. More generally, governments contemplating PPPs need to give careful consideration to

related risk-sharing mechanisms (OECD, 2007; IMF, 2015a, b; EBRD, 2011).

Policies for promoting responsible business conduct

Jordan's Government, private firms and non-governmental organisations are progressively incorporating responsible business conduct into their practices across economic sectors. The Government developed a *Corporate Governance Code* based on the OECD *Principles of Corporate Governance* (OECD, 2015e). The Jordanian Government has also ratified human rights conventions and reinforced the legal and institutional framework for employment and labour relations, particularly since 2011 (OECD, 2013a). The EBRD's 2011 assessment of Jordan corporate governance however revealed that Jordanian corporate governance framework was in relatively "low compliance" with international standards (EBRD, 2016). Future analysis is needed to assess priorities to promote RBC specifically across the solar- and wind-energy value chains in Jordan.

Policy support to energy efficiency

This report does not review policies for promoting energy efficiency in Jordan. It is however important to remind that Jordan has established several legislations, policies and regulations for encouraging energy efficiency, with support from donor agencies and multilateral development banks, including the World Bank Group.

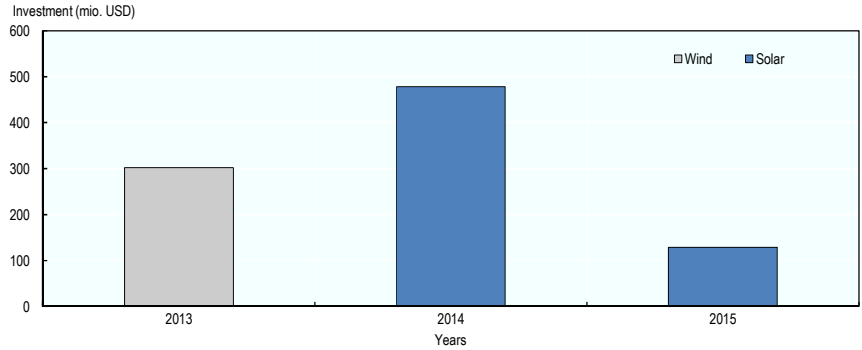
Key trends in investment in renewable power in Jordan

Largely driven by increased policy support in the past few years, Jordan has managed to attract investment in renewable power[9] since 2013, from no investment in 2012 to USD 302 million in 2013 (in one wind-power project) and to USD 478 million in 2014 (in six solar energy projects; Figures 1.3 and 1.4; BNEF, 2015). Investment then declined to USD 129 million in 2015. The 58% increase in investment between 2013 and 2014 represented the largest growth rate in the MENA region behind Morocco. Most new investment flows are in grid-connected solar PV and wind energy projects.

As of September 2016, according to Bloomberg New Energy Finance (BNEF), the pipeline of renewable-power deals in Jordan included 13 completed deals in solar and wind energy, and eight deals announced or under development (BNEF, 2016). Installed capacity in renewable-power projects increased to 18.5 MW in 2014 (RCREEE, 2015), and to 130 MW already connected as of May 2016. The Ministry of Energy and Mineral Resources (MEMR) estimates that around 1 000 MW of wind and solar PV projects are under development in Jordan, including 200 MW operational by

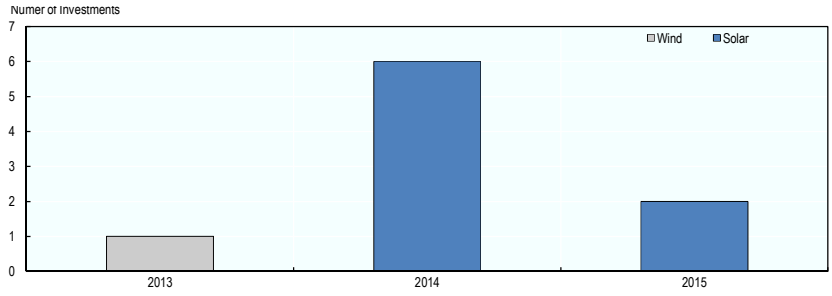
end of 2015 (MEMR, 2015b). NEPCO estimates that by end of 2016, there will be 500 MW of renewable-power projects connected to the grid in Jordan (Interview with NEPCO, 2016). An overview of projects is available in Table A.1.1 in Annex A.1.

Figure 1.3. **Investment flows in renewable-power projects in Jordan (USD million)**



Source: BNEF (2016), Database of new build projects and deals in biomass and waste, geothermal, hydro, marine, solar and wind energy projects in Jordan, as of 26 September 2016; including completed projects.

Figure 1.4. **Investment flows in renewable-power projects in Jordan (number of deals)**



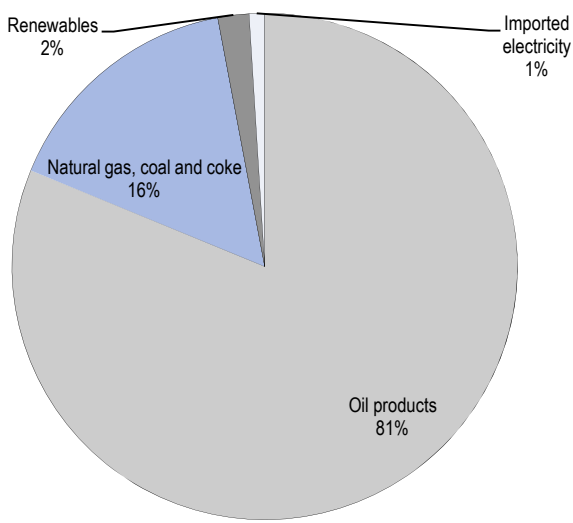
Source: BNEF (2016), Database of new build projects and deals in biomass and waste, geothermal, hydro, marine, solar and wind energy projects in Jordan, as of 26 September 2016; including completed projects.

Given the high costs of natural gas and diesel imports, electricity generation in Jordan using renewable-energy sources is an attractive and competitive alternative to fossil fuels (Clean Energy Pipeline, 2013). The 117 MW Tafila wind farm, which was developed by Jordan Wind Project

Company (JWPC), was the first utility-scale renewable-power project to connect to the grid; it reached commercial operation date (COD) in September 2015. It remains the only wind-power project commercially operational in Jordan, and sells electricity to NEPCO at USD 0.119 per kWh. In the solar sector, the 50MW Shams Ma'an solar PV power plant will sell electricity at USD 0.149 per kWh, which is significantly cheaper than the typical electricity generation cost as of 2013 from heavy fuel (USD 0.24 per kWh) or diesel (USD 0.28 per kWh; Clean Energy Pipeline, 2013).

Although the costs of solar PV and wind-power technologies have declined in recent years, Jordan's deployment of renewable power is still nascent; it represents less than 2% of the country's electricity generation mix in 2013 (Figure 1.5), and around 4% in 2015 (MEMR, 2016a), compared to the 7% target increase by 2015 and 10% by 2020 in Jordan's *National Energy Strategy*. In 2013, less than 2% of total primary energy was supplied by renewables sources, mostly from solar water heaters. As of 2016, the Government estimates that renewable sources have reached around 4% of the energy mix (MEMR, 2016a).

Figure 1.5. Jordan's energy mix as of 2013



Source: Hochberg, M. (2015), "Jordan's Energy Future: A Path Forward", adapted from MEMR, 19 August 2015, www.mei.edu/content/article/jordans-energy-future-path-forward.

Notes

1. The Arab Future Energy Index (AFEX) is a policy assessment and benchmark tool developed by Regional Center for Renewable Energy and Energy Efficiency (RCREEE) that provides a detailed comparison of renewable energy and energy efficiency development in 17 countries of the Arab region on more than 30 different indicators.

2. By-laws and regulations include: the Tax Exemptions By-law; the Direct Proposal By-law; the *Renewable Energy & Energy Efficiency Fund* By-law; the Reference Price List, with indicative prices for each type of renewable source; the regulations and directives on the *Sale of Electrical Energy Generated from Small Renewable Energy Systems through Net Metering for rooftops* and on the *Cost of Connecting Renewable Energy Facility to Distribution Grid*; and the *Electric Power Wheeling Directives* (EMRC, 2014).

3. Under the *Directive for the Costs of Connecting Renewable Energy Facility to the Distribution System for Direct Proposals and Competitive Tenders* (EMRC, 2015a).

4. Renewable-power projects can also be procured through Engineering, Procurement and Construction (EPC) turn-key contracts, which operate outside the REEEL.

5. "Wheeling" refers to the transfer of electric power through transmission and distribution lines from one utility's service area to another. The EMRC has issued wheeling regulations to encourage and regulate off-site renewable power generation and on-site consumption by private off-takers. Wheeling arrangements are similar to net metering arrangements, except for the fact that the renewables facility and the electricity-consuming site do not need to be co-located (OECD, 2014a).

6. NEPCO performs three functions: it is legally obliged to purchase electricity generated by IPPs as Jordan's single buyer of electricity; it must bear the cost of interconnecting power plants to the grid, and is responsible for the transmission network, which includes the regional interconnector system that transmits electricity from Egypt and Syria; and it is the bulk supplier of electricity sold directly to industrial firms and other major outlets like Queen Alia International Airport.

7. The project will attract a total investment of around USD 170 million, with the European Investment Bank extending a USD 72 million loan; Tenders Info, 2016. In particular, Jordan has secured a EUR 100 million loan from the French development agency AFD and the EIB, and a EUR 50 million grant from the Neighborhood Investment Facility (NIF), to fund the first phase of the grid improvement plan. NEPCO will also support projects financing. A tender was launched in 2015. In May 2015,

the Chinese company Hanergy announced a USD 310 million grant to support transmission for renewable projects in Jordan (Cleantechnica, 2015; Jordan Times, 2015).

8. Issued in pursuance of Article 20 of the *Privatization Law* No. 25 of 2000 (Sawalha, 2015).

9. See Note 5 in the Assessment and recommendations section.

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ANNEX 1.A1.

Overview of existing renewable-power projects in Jordan

Table 1.A1.1. **List of ongoing renewable-power projects in Jordan (as of August 2016)**

Project	Sponsor(s) and additional information	Project cost	Status	Estimated project size
Tafila wind project	Jordan Wind Project Company (EPGE, InfraMed Infrastructure, Masdar Power)	302 million	Completed	117 MW
Ma'an Solar Park 1 in Ma'an Development Area (MDA)	Includes several solar projects, led by Ma'an Development Company:			160-70 MW in total:
	• Al Zanbaq for Energy Generation	n/a	n/a	10 MW
	• Zahrat Al Salam for Energy Generation;	USD 30 million	n/a	10 MW
	• Al Ward AL Joury for Energy Generation;	n/a	n/a	10 MW
	• SunEdison Italia Construction S.r.l – Jordan PSC – Sponsors:	n/a	n/a	20 MW
	• Shams Ma'an Power Generation PSC - Kawar Energy Sponsors: Nebras Power (joint venture between Qatar Electricity and Water Company, Qater Holding, Qatar Petroleum International), Diamond Generating Europe, Kawar Group;	n/a	Construction; reached financial closure reached; Commercial operations date by end-2016	50 MW
	• Arabia One for Clean Energy Investments, Ennera Energy and Mobility, Hanwha E&C, Arabia Trading & Consulting	USD 30 million	Completed	10 MW
	• Anwar Al Ardh for Solar Energy Generation PSC; Sponsor: Scatec Solar AS	USD 68 million	Completed	20 MW
	• Ardh Al Amal for Solar Energy; Sponsor: Scatec Solar AS and	USD 34 million	n/a	10 MW
	• Saqer Ma'an Lal-Taka Al Shamsia LLC	n/a	n/a	20 MW
Fujeij wind farm	Korea Electric Power Corp	USD 187 million	Pre-construction	90 MW
TSK Al Qweira PV Plant	Funded by Abu Dhabi Fund. Constructed by TSK Grupo and Enviromena Power Systems using an EPC contract	USD 128 million	Pre-construction	100 MW
Ma'an wind farm	Kuwait Fund for Arab Economic Development	USD 149 million	Completed since April 2016	80 MW

Mafraq solar project	Philadelphia Solar Power Company	USD 23 million	Completed	10 MW
Adenium - Martifer Solar Farm	Adenium Energy Capital, Bright Power Group	USD 26 million	Completed	10 MW
Pilot CSP plant and research lab	Solar Euromed	USD 5.8 million	Pre-construction/ construction	0.5 MW
Oryx Solar Project	Scatec Solar AS	USD 31 million	Completed	10 MW
Shamsuna PV Plant in Aqaba Special Economic Zone	Shamsuna Power Co; Foursan Capital Partners I (owner)	USD 20 million	Construction	10 MW
Royal Hashemite Court PV Plant	n/a	n/a	Commissioned	5.6 MW
Sterling & Wilson Jordan PV Plant	n/a	n/a	Pre-construction	62.5 MW
Martifer Solar Jordan PV Portfolio	Martifer Solar SA (developer)	n/a	Construction	37 MW
GreenWatts Al Rajef Wind Farm	Green Watts LLC (developer). Alcazar Energy Partners is the new sponsor/owner of the project	USD 186 million	Pre-Construction	83 MW
Hecate Bab il Hawa Wind Farm	Hecate Energy LLC (owner and developer), then acquired by Alcazar Energy Partners in 2016	n/a	Permitted, PPA signed in Fall 2016	50 MW
Xenel Tafilah Wind Farm	Xenel Industries Ltd (owner and developer)	n/a	Permitted	49.5 MW
Korea Southern Power Tafilah Wind Farm	Korea Southern Power Co Ltd (owner and developer)	n/a	Permitted	49.5 MW
Mafraq I-IV PV Plant	FRV (Fotowatio Renewable Ventures) is the sponsor for two projects. ACWA Power is the sponsor of one project. Fourth project may be acquired, and for now is sponsored by Saudi Oger	n/a	Pre-construction; PPAs signed; Construction to start in 2018	4 X 50 MW
Water Authority of Jordan (WAJ)	Private developer to be selected to sign a 20-year PPA with WAJ to offset its electricity consumption	USD 70-100 million	Under development	50 MW
Introduction of Renewable Energy in 3-5 water supply stations using PV water pumping systems.	EU grant managed by EBRD for the benefit of WAJ	EUR 30 million	Under development (due diligence stage)	25 MW

Sources: Based on literature review and consultations; BNEF database; MEMR; World Bank; UNEP; EU; USAID; and Clean Energy Pipeline.

Table 1.A1.2. **Activities of donors and international financial institutions (IFIs) in renewable energy and energy efficiency sector**

Donors and IFIs	Main Activities	Funding (USD)	Period
USAID	Jordan Competitiveness Program (JCP) activities on clean technology (CT) sector	n/a	On-going
	Energy Sector Capacity Building Program : Develop the utilities incentive mechanism to promote EE	USD 19 Million	2013-16
	Electricity Utility Transmission and Distribution Partnership (partner: National Electric Power Company)	USD 1.4 million (grant)	2009-12
	Electricity Regulatory Commissions Partnership (partner : Electricity Regulatory Commission)	USD 660 000 (grant)	2009-12
European Union	Renewable Energy and Energy Efficiency Programme: Encourage energy consumers and enterprises to improve the efficiency of energy use and invest for RE/EE	EUR 40 Million (grant)	2011-15
	New Renewable Energy and Energy Efficiency Programme, including 50% in budget support to the Government	EUR 90 million	2017-20
EBRD	Financed four solar PV projects with a total capacity of 60 MW, all of which have commissioned in 2016 under a 20-year PPA with NEPCO	USD 75 million from EBRD, USD 200 million total projects cost	2014 signing, 17 year tenor
	Board approved the debt financing of two solar PV projects and one wind project with a capacity of 100 MW and 83 MW, respectively	USD 135 million from EBRD, USD 356 million total projects cost	2016 signing, 17 year tenor
	Framework in place to support private to private renewable-energy projects in Jordan, Egypt, Tunisia, and Morocco through a combination of gap analysis of the current legal and regulatory frameworks for private renewable projects to be addressed through policy dialogue along with finance to demonstrate the success of the initial projects under these new private models	USD 250 million from EBRD coupled with USD 50 million in concessional co-finance, to leverage USD 900 million in projects cost	
	Introduction of Renewable Energy in 3-5 water supply stations using PV water pumping systems	EUR 30 million grant provided by EU and managed by EBRD	2017
	Private developer to be selected to sign a 20-year PPA for a 50 MW with WAJ to offset its electricity consumption	USD 70-100 million	2017
UN Environment Programme	Global Market Transformation for Efficient Lighting in Jordan	USD 50 000 (grant)	2012-13

Donors and IFIs	Main Activities	Funding (USD)	Period
World Bank Group	Improving investment climate for renewable energy and energy efficiency (Partner : OECD)	USD 140 000	2014-16
	Promotion of Wind Power Market : Develop a promotional wind IPP power plant (60-70 MW) in Fujeji (co-donor : Global Environment Facility)	USD 6 Million (grant)	2008-13
	Energy Efficiency Investment Support Framework in industrial and commercial sectors (co-donor: Global Environment Facility)	USD 1 million (grant)	2009-13
	Clean Technology Fund Support for Jordan CSP Program (co-donor: International Finance Corporation)	USD 50 million (concessional loan for the private sector)	n/a
AFD (France)	Energy Efficiency in Street & Residential Lighting(Partners : National Energy Research Council, Ministry of Energy and Mineral Resources and Ministry of Planning and International Cooperation)	USD 470 000 (grant)	2009-12
	Support Framework for Energy Management in Jordanian Industrial and Services Sectors for preparation of the JREEEF(Partner : Ministry of Energy and Mineral Resources)	EUR 1.56 million grant from *Fonds Français pour l'Environnement Mondial* (FFEM)	2008-12
	Energy Efficiency and Renewable Energy Credit Line Partner: Capital Bank and Cairo Amman Bank	USD 53 million (credit line); USD 340 000 (technical assistance grant)	2011-24
	Support to the implementation of the Energy Efficiency Roadmap (Partner : Ministry of Energy and Mineral Resources)	EUR 500 000 (grant)	2011-16
	Energy Sector Policy Loan (Budget Support) (Partners : Ministry of Planning and International Cooperation, Ministry of Finance and Ministry of Energy and Mineral Resources)	EUR 150 million (loan)	2012-13
	Green Corridor project to set up transmission lines and upgrade existing ones to support the development of renewable projects	USD 44million (loan)	2015 -
Japan	Introduction of Clean Energy by Solar Electricity Generation System (RSS and Dead Sea Panorama)	USD 7 Million	n/a
	Energy Conservation through Upgrading Water Supply Network	USD 12.7 Million	n/a
	110 Hybrid Vehicles	USD 3 Million	n/a
Abu Dhabi Fund for Development	Solar Power Project	USD 150 Million	2013-15
Kuwait Fund for Arab Economic Development	Wind Power Project	USD 150 Million	2013-16

Donors and IFIs	Main Activities	Funding (USD)	Period
Germany	Energy Efficiency in Public Buildings with MOPWH	EUR 15 Million	n/a
	Energy Efficiency in the Water Sector	EUR 26 Million	n/a
	Climate Protection in the Wastewater Sector	EUR 20 Million	n/a
	Training in Water and Energy Efficient Developments	EUR 2 Million	n/a
Spain	3 MW Solar PV Power Plant	EUR 5.9 Million	n/a
	1 MW Solar PV Power Plant in Azraq	USD 5.2 million (debt swap)	2010-13

Note: Updated as of August 2016.

Source: Based on literature review and consultations with USAID, European Union, UNEP, World Bank, AFD, Japan, Abu Dhabi Fund for Development, Kuwait Fund for Arab Economic Development and MOPIC.

Chapter 2

Policy suggestions to strengthen the enabling conditions for investment in renewable power in Jordan

The Jordanian Government has implemented very promising initiatives to help mobilise investment in renewable power. Based on in-house research, literature review, interviews and stakeholder consultations, this report provides non-prescriptive suggestions for Jordanian policy makers to consider in order to enhancing the already robust and comprehensive legislative and regulatory framework for investment in renewable power. The suggestions span all policy areas covered by the Policy Guidance for Investment in Clean Energy Infrastructure. *This report also identifies the key challenges faced in each of these areas and proposes concrete measures for addressing them.*

The suggestions provided in this chapter are structured around the policy areas and questions raised in the OECD *Policy Guidance for Investment in Clean Energy Infrastructure*, as summarised in Table 2.1.

Table 2.1. **Areas covered by the OECD *Clean Energy Investment Policy Review of Jordan* from the *Policy Guidance for Investment in Clean Energy Infrastructure***

Policy areas in the *Policy Guidance*	Policy Areas covered in the OECD *Clean Energy Investment Policy Review of Jordan*	Overall objectives
Investment policy	• General investment environment • Bilateral investment treaties and free-trade agreements • Foreign ownership • Local-content requirements • Intellectual property rights • Access to land	Applying investment policy principles such as non-discrimination of international versus domestic investment, investor protection and intellectual property protection, contract enforcement and transparency.
Investment promotion and facilitation	• Reforming support measures to fossil fuels • Carbon pricing • Long-term policy goals • Investment incentives: feed-in-tariff, procurement process, net metering, fiscal incentives, greening of government facilities • Licensing procedures • Policy monitoring	Improving coherence of the broad system of investment incentives and disincentives, e.g. by setting long-term goals, setting well-targeted and time limited incentives (e.g. feed-in tariffs), and facilitating the licensing of renewable-power projects.
Competition policy	• Promoting structural separation of the electricity market • Increasing competition in the energy market • Other aspects of competition policy	Levelling the playing field between independent power producers (IPPs) and state-owned enterprises (SOEs) and between national and foreign actors to tackle market rigidities that favour fossil-fuel incumbency in the electricity sector.
Financial market policy	• Renewable energy and energy efficiency investment fund • Other financing mechanisms	Strengthening domestic financial markets and providing specific financial tools and instruments to facilitate access to long-term finance.

Public governance	• Independence of energy regulators • Mapping of energy resources • Grid management • Policy co-ordination	Enhancing co-ordination between different levels of governance (e.g. to align national and sub-national policies), ensuring the independence of the electricity market regulator, and co-ordinating the planning and deployment of the electricity grid with that of renewable power.
Other policies and cross-cutting issues	• Public-private partnerships • Responsible business conduct • Export strategy for renewable energy	Strengthening other policies, e.g. to improving financial leverage and generate investment opportunities, including through: regional co-operation; making and implementing the choice between public and private provision of renewable power; and ensuring that renewable-power support policies are compatible with World Trade Organization (WTO) rules

Source: Adapted from OECD (2015a), *Policy Guidance for Investment in Clean Energy Infrastructure,* OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264212664-en.

Investment policy

The quality of investment policies directly influences the decisions of all investors, whether small or large, domestic or foreign (OECD, 2015a, d). This section reviews priorities to promote sound investment policy principles for investment in renewable power in Jordan, including: restrictions on foreign ownership; non-discrimination; access to land; and protection under investment treaties. A number of suggestions are provided in these areas.

Foreign ownership

Although foreign investors can invest in renewable-power projects in Jordan, there are outstanding regulatory restrictions to foreign direct investment (FDI) in Jordan, as part of the *Regulation on Non-Jordanian Investments* (SDC**,** 2000). In particular, foreign ownership of projects in engineering or construction services is limited to 50% of capital costs. Following the enactment of the *Investment Law*, the Jordanian authorities

have reformed the institutional framework and acknowledged the need to further improve and unify regulatory framework. The ongoing amendment process and revision of *Non-Jordanian Investments* by-law would provide an opportunity to enhance the investment regime, by examining whether the motivations behind existing discriminatory restrictions on non-Jordanian investors remain valid and continue to support their intended public purpose (OECD, 2015f). Clarifying the definition of the nationality of investor would be useful to circumscribe the scope of the restrictions that apply to "non-Jordanian investments" (OECD, 2015f). As part of the revision of the by-law, the Jordanian Government could also reassess the existing exceptions to national treatment currently provided for in the Regulation No. 54 of 2000 on *Regulating Non-Jordanian Investments* (OECD, 2015f, 2014a).

Non-discrimination: local-content requirements

The direct proposal submission (DSP) scheme featured in 2015 a 15% bonus for bids that included a 100% local-content requirement (Apricum, 2015). The "Reference Price List for different Renewable Technologies" also included preferential pricing for local-content manufacturing (MEMR, 2016a). Previously, the first round of the direct proposal scheme included a requirement to use 20-25% of local-content for the construction of projects such as the Tafila wind-power project (excluding equipment, since there is no domestic manufacturer of turbine components in Jordan, only assemblers of wind turbines using imported components). The DPS scheme also included incentives to use local turbines, through preferential treatment on custom duties and fees. To encourage the local manufacturing of renewable-energy technologies, the Government was also considering in 2015 attaching a 100% local-content requirement (LCR) to its net metering programme, which would offer small-scale renewable power producers a 15% bonus to existing net metering tariffs.

Based on OECD analysis of the impacts of LCRs on renewable energy investment, setting stringent local-content requirements in Jordan would have several important disadvantages. It could increase the cost of inputs for downstream power producers, thereby hampering international investment in downstream solar PV and wind-power generation, which have potential for significant value-added (OECD, 2015c). Currently, there is only one domestic assembler of solar PV panels in Jordan (Philadelphia Solar), two manufacturers of solar water heaters (Hanania Solar and Nur Solar Systems), and no manufacturer of PV or wind turbines' components. Given the small number of domestic solar PV and wind-turbine manufacturers and the correspondingly difficult challenge of meeting a stringent LCR without

significantly increasing costs for downstream power producers, the Government could usefully consider avoid considering setting local-content requirements for solar or wind energy. Instead, the Government could provide targeted incentives for industrial promotion for specific solar PV components that are not yet manufactured local (e.g. inverters), for instance through fiscal incentives in Aqaba Special Economic Zone. More broadly, the Government could usefully develop an integrated industrial strategy for clean technologies, including renewable energy, by assessing the value added and job creation potential across segments of the value chains (Interview with EDAMA, 2016).

Access to land

One of the major challenges for renewables investment in Jordan is accessing lands suitable for renewable-project development (Tsagas, 2015). Land access can hinder renewable projects whether at grid-scale, under the direct proposal submission scheme, or at small-scale, under the wheeling scheme.

Access to land can hinder renewable-power projects under the direct proposal submission scheme. Indeed, the direct proposal submission scheme does not require the Ministry of Energy and Mineral Resources (MEMR) to acquire or lease land, which creates additional burdens and transaction costs for independent power producers in renewable power. The choice of land is left to the developer. The Government allows PV-power plants to be set on public land, via Mafraq Development Corporation (MDC; MEMR, 2015a). Based on interviews with renewable-project developers in Jordan, independent power producers must currently undertake lengthy negotiation process with land owners and contend with land speculation, resulting in higher project costs, as experienced by several project developers in the first round of the direct proposal submission scheme. Partly as a result of lengthy land lease procedures with private land owners, using a standardised land lease agreement (LLA), three out of four project developers under Phase 2 of the direct proposal submission scheme have accepted the MDC land offer (MEMR, 2015a).

Policy makers could usefully streamline the land acquisition and land lease process, for example by creating a database of available government lands for new renewable projects (GIZ, 2014; Interview with EBRD, 2016). Reducing delays and transaction costs involved with land acquisition by encouraging earlier processing would also be useful, e.g. by facilitating land acquisition procedures through a central office (RCREEE, 2015). Converting land use ahead of renewables projects' development or installation would also reduce the time needed by developers to acquire land use approvals (OECD, 2015b). Additionally, the Government could identify

available private lands, and provide lenders with a mechanism to ensure that leases of land with multiple private owners can be efficiently concluded, as well as to limit land speculation (GIZ, 2014).

The lack of transparency on available lands suitable for development of renewable facilities is also a constraint for renewable projects developed under the wheeling scheme. The Jordan Competitiveness Program (JCP) of USAID is working with the Jordanian business association EDAMA to improve wheeling procedures for renewable projects. The Government could usefully consider establishing a queuing system to better inform developers of renewable facilities under the wheeling scheme of available lands. Additional measures to facilitate approval from the distribution system operators (JEDCO, IDCO and EPCO) are discussed subsequently under the section on wheeling schemes.

Investment treaties

More specific language in investment protection provisions in Jordan's investment treaties would lead to increased predictability and thereby benefit both investors and the government. Such specifications also reflect policy choices. Policy makers need to carefully consider the costs and benefits of these choices, and their potential impact on foreign investors and domestic investors, as well as on the host state's legitimate regulatory interests.

The renewable-energy sector also illustrates policy issues that apply to investment treaties more broadly. Protection offered to incumbent investors in the traditional energy sector may, for example, increase the cost for government measures or regulation fostering investment in renewable power. Arbitral practice shows that investment treaties may also be used by renewable-power investors to challenge government measures seeking to adapt and improve incentives, thereby creating additional constraints on the government in implementing new policies (IAReporter, 2016). In designing its investment treaty policy, Jordan could therefore consider and balance the role of treaties in fostering international investment and the impact of treaties on the government's regulatory interests, including on clean energy policies. The potential impact of investment treaties on different groups of investors, such as foreign and domestic investors, or incumbent and new investors, also needs to be considered by policy makers.

Investment promotion and facilitation

This section highlights possible areas for the Government to consider in order strengthening its comprehensive set of incentive schemes and regulations to promote and facilitate investment in renewable-power projects

in Jordan. Such policy suggestions could help create a pipeline of bankable renewables projects.

Direct proposal submission

Increased transparency, predictability and streamlined procurement process is needed to improve the direct proposal submission scheme for renewable projects. Several rounds of the scheme have been delayed or even cancelled, including the third round for solar PV energy and the second round for wind energy (see Table 1.2). Project developers have also complained in interviews conducted in 2015 and 2016 about the burdensome bidding process, due to the amount of information requested for direct proposal submissions. Currently, the MEMR requires an applicant's expression of interest (EOI) to include a profile of both the applicant and the project, a track record of the applicant's experience and ability to raise equity and debt. For instance, the bidder must have experience in raising funds larger than USD 10 million. The applicant is also requested to provide a description of the project's estimated generation capacity on annual basis, location with co-ordinates on a map, and envisaged wind or solar power technology. Additionally, the applicant is required to contact the relevant transmission or distribution grid company, which confirms the suitability of the envisaged grid connection at the location suggested in the proposal (Chadbourne & Parke, 2014; GIZ, 2014). Other stakeholders claim that these burdensome procedures are due to lack of co-ordination among different public entities, especially between the MEMR and NEPCO. Stakeholders further claimed that reasons for the delays have not always been clearly communicated (Interviews with project developers, 2015). Some private stakeholders and officials from the Ministry of Environment claimed that the MEMR is not always fully transparent about which applicants win bids and what capacity they are allocated. Other interviewed stakeholders claimed that the MEMR tends to award a large portion of bids to certain companies instead of opening the process for competition.

The direct proposal submission (DPS) scheme has been extremely successful in attracting bidding for solar PV projects, and to a lesser extent for wind-power projects. Currently however, the DPS scheme is applied outside of its original scope. Indeed, the DPS scheme is currently used by non-commercial entities such as universities, but is not attracting sufficient applications from private investors. One reason stems from the cumbersome and bureaucratic application process.

Long-term power purchase agreements

NEPCO is committed to purchasing all electricity generated from renewable energy at negotiated prices, through signing long-term purchase

agreements (PPAs), typically with a 20-year timeframe. Thus, it is permitted to re-evaluate the financial conditions of the PPAs, taking into account trends in the cost of renewable energy from time to time. However, once contracts are signed based on negotiations, any unilateral changes on signed contracts might create uncertainty for investors. Providing more certainty on possible renegotiations of the financial conditions of the PPAs could be useful (IMF, 2015a).

Net metering and wheeling schemes

This report has identified several priorities to facilitate the use of net metering and wheeling procedures for residential, commercial and industrial consumers to develop renewable-power projects. Policy suggestions for the Government and municipal authorities to consider include notably:

- Improving the transparency of the land selection process, as discussed previously;

- **Encouraging distribution companies and municipalities to facilitate the net metering and wheeling schemes.** Currently, distribution system operators ask renewable projects to fit various requirements to qualify for the wheeling and net metering schemes, such as: distance of renewable plant from the main office of the consumer; or share of households using wheeling or net metering schemes. The Government and municipalities could usefully ease the existing requirements to qualify for the wheeling and net metering schemes, e.g. by allowing each neighbourhood to use a higher percentage of electricity consumed through net metering, or by reforming municipal grid codes to increase the distance permitted between renewable facilities and consumers' main location through the wheeling scheme.

- **Clarifying the use of pooling by commercial, industrial or residential consumers**. Such residential users often lack technical capacity to set the special purpose vehicle[1] (SPV) required to set a renewable facility using pooling under the wheeling scheme. As of May 2016, the Government had not issued any permit yet for a pooling project. Yet pooling can facilitate the development of renewable facilities through wheeling procedures, e.g. by sharing the financial burden of relatively high-upfront capital costs of renewable plants across consumers. USAID's Jordan Competitiveness Program (JCP) is for instance helping a group of hospitals to set up a SPV to pool themselves so as to set a renewable facility under the wheeling scheme. The Government

could usefully facilitate the process to set a SPV for a pooling process, and clarify the procedures to obtain a permit from the EMRC. In the absence of a facilitated process for pooling under the wheeling scheme, several public hospitals and universities have opted to produce renewable energy through the direct proposal submission scheme, thanks to an exemption from the law.

- **Encouraging the use of the net metering and wheeling schemes for larger distributed solar PV or wind-energy systems.** To facilitate it, the Government could clarify or adjust the capacity tariff structure applicable for large commercial and industrial consumers (RCREEE, 2015, 2014; PV Magazine, 2015a, b).

- **Revising the recent regulation on fully electric vehicles** published in May 2016 to allow users to set a separate meter to plug their electric vehicles to power, and allow electric vehicles' users to use the wheeling scheme, and negotiate directly with distribution system operators if the power is based on renewable sources. This recommendation from the Ministry of Environment could encourage the use of electric vehicles in Jordan.

- **Allowing wheeling users to sell their excess electricity.** Currently, the renewable electricity produced through the wheeling scheme is limited to self-consumption. The Government could allow wheeling users to sell their excess electricity, either by connecting it to national transmission grid via the singly buyer, NEPCO, or by reforming NECPO's single buyer model to allow users to sell their excess power directly to distribution system operators.

Feed-in tariff

There were uncertainties around the feed-in tariff process, which was mostly implemented in 2012-13. Should the feed-in tariff be used again by the Government, more clarity would be needed to make the investment environment more predictable. The Energy and Minerals Regulatory Commission (EMRC) determined maximum tariff levels and published them in the reference price list. As discussed, the reference price list[2] established a price ceiling for the tariff available through the direct proposal submission scheme. However, the process and the method for determining the maximum tariff levels as well as the way they might evolve over time was not transparent, and there was an asymmetry of information between investors and the energy regulator (OECD 2014a). Clarity would have been

needed as to when and on what basis the feed-in tariff was subject to change (e.g. to adapt to changes in input costs, speed of deployment, achievement of targets, geographical differentiation). The details of the method for reviewing prices, or establishing the original tariff levels could have be described in a public document, and the MEMR could have host clarification meetings with bidders on a regular basis (OECD 2015a, b).

Fiscal incentives

The Government could review the structure of fiscal incentives for projects to generate electricity from renewable energy, to improve consistency, implementation and transparency of fiscal incentives (RCREEE, 2015). The exemption from sales tax and customs duties for renewable projects from the REEEL is not systematically applied, due to lack of information on the tax exemption in relevant government agencies. Public awareness and information campaigns are needed to outreach on the available fiscal incentives for renewable-power projects. In addition, the same kind of exemption is not applicable when leasing renewable-power-related services (such as providing a capital lease or renting or providing renewable systems as a service). This could hamper the business model of solar PV and wind-energy projects in Jordan, based on interviews with private renewable energy investors in Jordan.[3]

Reforming support to the consumption of fossil fuels and electricity tariffs

The overall electricity tariff structure in Jordan is largely favourable to residential and agricultural consumers, compared to large commercial users. Commercial-scale electricity consumption (i.e. above 600 kWh per month) is not subsidised, while the Government is subsidising electricity prices for households, which typically consume less than 600 KWh/month, as well as agricultural users. This tariff structure therefore penalise large commercial consumers of electricity, and creates disincentives for commercial firms to produce renewable power, including through wheeling or net metering. The Government could usefully review the current electricity tariff structure in order to encourage renewable-power generation from large commercial users.

Jordan implemented electricity tariff increases of 15% in January 2015 (benchmark) for hotels and restaurants as a step towards gradually phasing down fossil-fuel support. The Government however decided in May 2015 to reduce the 15% increase by half to support economic growth. The Government could consider reverting to the full tariff increase soon, while protecting the most vulnerable households.

Reforming fossil-fuel support represents an opportunity to support renewables investment by removing price distortions for conventional and clean fuels at a time when oil prices remain low (IMF, 2015b). The current system of support measures for the consumption of fossil fuels is an inefficient means of social protection. Pre-tax subsidies to oil products reached 8% of government revenues in 2011, and pre-tax subsidies to electricity reached 14% of government revenues in 2011, thereby burdening the national budget. Energy subsidies in Jordan – as in several other countries – disproportionately benefit the wealthier segments of the population. In a recent study, the IMF found that the poorest quintile in Jordan receives only about 1-7% of total diesel subsidies, while the richest quintile received around 42-77% of the total subsidies (Sdralevich et al., 2014; El-Katiri and Fattouh, 2015). Conversely, well-targeted subsidies for specific social groups, e.g. through vouchers or selection of fuels consumed mostly by the poor, can help enhance the effectiveness of subsidies while in alleviating their fiscal burden.

Licensing procedures

Streamlining and unifying licensing and registration procedures for renewables projects could help decrease transaction costs for investors and project developers. Until recently, both foreign and domestic investors had to deal with numerous governmental institutions concerning approval of and licensing for investment projects, including renewable-power projects, such as: the Ministry of Energy and Mineral Resources; the Energy and Mineral Resources Commission; the National Electric Power Company; and the Ministry of Environment. The Government has established a one-stop-shop (OSS) Investment Window within the Jordan Investment Commission (JIC) to facilitate licensing procedures for all types of investment. However to date, this one-stop-shop has had little responsibilities with renewable projects, which are primarily licensed through the EMRC for projects larger than 1 MW. The Government could clarify the role of this one-stop-shop for renewable projects, and customise it to the specific licensing needs of renewable-power projects. Additionally, both domestic and foreign investors for renewable-power projects have suggested that the OSS could help not only investors, but also contracting companies and other suppliers involved in engineering, procurement and construction (EPC) contracts, by facilitating registration and customs clearance.

Long-term goals and strategic planning

Jordan's *National Master Energy Strategy* for 2007-20 could usefully be updated, to align infrastructure planning with renewable-power deployment objectives, and send long-term and credible signals to renewable-power

investors. At present, there appears to be some scepticism about the strength of the government's commitment to renewable energy, in part due to the attention currently being given to nuclear energy, oil shale and imports of LNG. In fact, the current renewable-energy targets specified in the *Jordan 2025* Blueprint are less ambitious than those indicated in Jordan's *National Master Energy Strategy* for 2007-20. The targets in *Jordan 2025* (also called "Jordan Vision 2025") and in the *National Master Energy Strategy* could therefore be strengthened, especially as they are not ambitious compared with other countries in the MENA region. For instance, Tunisia has a target of 16% by 2016 and Morocco has a target of 15% by 2020, compared to Jordan's 10% target in the primary energy mix by 2020. In the meanwhile, the MEMR has just announced new targets to reduced energy consumption between 2015 and 2025 (MEMR, 2016c). NEPCO could also usefully develop its strategy for renewable deployment after 2020. In addition, Jordan's objectives for the sustainable development goals (SDGs), green growth and climate change could usefully be integrated in *Jordan 2025* strategy.

National GHG emissions reduction targets could be complemented by an emissions-reporting system to facilitate tracking and by measuring progress, including at the local government level, in stimulating small-scale renewable-energy investments. The Government could also adhere to the OECD *Green Growth Declaration*, to pave the way for further co-operation with the OECD on green growth. Jordan could thereby benefit from an understanding of how other countries, with similar developmental challenges, have been able to green their economies and societies.

Facilitating renewable deployment in special economic zones

Aqaba Special Economic Zone Authority (ASEZA) could further facilitate the deployment at commercial- or grid-scale renewable-power projects in Aqaba. A few renewable projects are currently planned in Aqaba Special Economic Zone, such as Shamsuna PV plant (10 MW; see Figure 1.A1.1; Annex 1.A1), as well as smaller projects (e.g. a 3.2 MW project in Ayla Oasis). Currently however, the largest energy project in Aqaba involves the transport of natural gas, with the inauguration in 2015 of the Sheikh Sabah Al Ahmad Terminal in Aqaba, to pump liquefied natural gas (LNG) to electricity-generating stations across Jordan (Jordan Times, 2015). In order to encourage the development of new solar PV projects in Aqaba, Aqaba Special Economic Zone Authority (ASEZA) could consider setting targeted fiscal incentives for renewable-power projects. In addition, it is considering developing its own transmission grid, independently from NEPCO.

Policy monitoring

Policy monitoring and evaluation efforts could be strengthened to ensure that approved renewables projects and investor incentives achieve their intended objectives. For example, Jordan's April 2013 by-law on solar water heating (see Chapter 1) has not been supported by policy monitoring. The by-law requires the installation of solar water heaters for every new multi-family building with more than 150 square meter of living space, for every new office building exceeding 100 square meter of floor space, as well as for each new public building with more than 250 square meters. However, there have been no further regulations or policies enforcing quality standards or system sizes. Some solar private investors have claimed that the solar obligation has not increased the profitability of investment because adherence to the rules is not enforced, and the follow-up by the Government agency is not as demanding as investors had expected. Additional monitoring and evaluation could help improve the effectiveness of the solar water heating obligation.

Competition policy

Despite very significant reforms, the current organisation of Jordan's electricity sector still presents some obstacles to attracting private investment in renewable power. This section reviews key issues to address in the electricity market structure in order to unlock large-scale investment in renewable-power projects in Jordan.

Reforming Jordan's single-buyer model

Jordan's electricity market structure is based on a single-buyer model (with NEPCO acting as single buyer), which can limit the penetration of renewable energy in the electricity sector. Jordan could further open its power generation market to level the playing field for independent power producers of renewable power, including through the direct proposal submission and wheeling schemes (as stressed by several Jordanian stakeholders during interviews conducted by the OECD in Amman in May 2016). In particular, the Government could consider enabling the three main electricity distributors to purchase electricity directly from the producers at market prices reflecting supply and demand (Ayoub Abu-Dayyeh, 2015). The electricity market's current single-buyer model hampers the negotiating strength of some independent renewable-power producers. This model does not yet allow for the full competition that would be provided in a market with multiple buyers. Currently, the single buyer NEPCO acts de factor as the market operator; it is the only entity allowed to sign power purchase agreements (PPAs) with generators. The *General*

Electricity Law No. 13, however, provides a basis for a transition to a competitive electricity market in Jordan. Indeed, Article 48 of the *Electricity Law* indicates that the Council of Ministers can decide to make a shift to the multi-buyer model once it considers that the sector has sufficiently been developed. Allowing for merchant PPAs to sell electricity directly through users (e.g. at Aqaba Special Economic Zone) would require significant regulatory changes, but could be a relevant long-term strategy for the Government.

Enhancing grid flexibility through demand-side management

Opening the power retail sector can be complemented by demand-side management tools to increase demand responsiveness (OECD, 2015a). Increased penetration of renewable power in the grid calls for increased flexibility of power transmission and distribution, e.g. through flexible demand-side management tools such as smart grids and smart metering. In 2012, Jordan launched a series of studies to carry out the largest upgrade of the country's electricity infrastructure in over 30 years. Under an agreement signed by the US Trade and Development Agency (USTDA) and the EMRC, the United States provided USD 1.15 million in financial support to Jordan to explore how smart grids can increase safety, reliability and load management capacity for the three largest electricity distributors in the country, namely the Electricity Distribution Company, the Irbid Electric Power Company and the Jordanian Electric Power Company. The studies explored the feasibility and benefits of introducing smart meters to provide up-to-date data on capacity loads for providers and accurate billing information for consumers (Metering and Smart Energy International, 2012). Smart metering can provide online data on capacity loads and timely billing information for electricity consumers. Smart grids can also help match electricity supply from future renewable-power plants with existing and new oil shale-fuelled power stations (MEMR, 2015a).

Ensuring priority access to the grid

Along with providing guaranteed grid access to renewable-power IPPs, Jordan policy makers could consider introducing priority access and priority dispatch to increase the competitiveness of renewable-power projects. Priority access ensures prioritisation of renewables projects if there are several actors requesting access to the grid in a given location. Priority dispatch enables producers of renewable power to sell all of their electricity in preference to conventional fossil-fuel generators. The priority dispatch of for renewable-power producers implies that fossil-fuel generators are obliged to reduce their generation levels in cases of transmission congestion (RCREEE, 2015).

Greening public procurement

The Government could be a more active user of renewable energy and promoter of energy efficiency in its own facilities and infrastructure, through greening public procurement procedures. As a reminder, the Government accounts for 40% of Jordan's economy; and 40% of the workforce in the country is employed by the public sector. Public facilities represent the largest potential single market for off-grid renewable-power projects, as well as energy efficiency improvements, e.g. in hospitals, schools and public buildings, as identified in interviews with project developers. Future analysis is needed to assess the potential for greening public procurement procedures in Jordan.

Financial market policy

Facilitating access to financing is critical to unlock investment in renewable-power projects in Jordan. Access to financing is typically one of the most problematic factors for doing business in Jordan (WEF, 2014). Multilateral development banks (MDBs), bilateral donor agencies and export credit agencies are the main sources of financing for Jordanian renewable-power projects. Attracting financing from international commercial lenders without public funding is challenging, and the capacity of Jordan's domestic financial institutions for long-term debt financing is limited (Chadbourne & Parke, 2014). During stakeholder consultations and interviews in 2015 and 2016 in Amman, several donor agencies, international finance institutions and project developers have highlighted outstanding issues and made recommendations, which are discussed further.

Encouraging the use of market financial instruments by the JREEEF

Jordan Renewable Energy and Energy Efficiency Fund (JREEEF) provides financial and technical assistance to project developers of renewable energy (and energy efficiency). Hosted within the Ministry of Energy and Mineral Resources (MEMR), the JREEEF fund is targeting small-scale solar projects by households, small and medium enterprises (SMEs), the tourism sector, the health sector, public buildings, and facilities such as schools (Venture Magazine, 2015). The fund provides financial support mainly through channelling grants and financing from donor agencies and IFIs. Based on interviews with a few donor agencies in Jordan, the JREEEF may have had limited impact so far due to delays and lack of technical capacity, despite an ambitious and promising objective. In addition, the JREEEF could make better use of financial market instruments (such as loan guarantees) in order to better leverage scarce donors' funding.

Increasing the participation from local banks

Increasing the involvement of local banks in renewables projects' financing has been identified by EBRD and several private investors as a key priority to unlock financing for renewable power in Jordan. The limited participation from local banks is due to several issues, including: difficulties for Jordanian banks to provide long-term loans; the fact that Jordanian banks issue loans in the local currency (Jordanian dinars) and not in USD dollars, which prevents flexibility on interest rates; and lack of technical capacity of local banks to carry out due diligence process.

In order to address this challenge, EBRD had offered to create a lending facility involving local banks, to provide them with technical assistance to carry out due diligence on possible renewable-power projects. The French development agency AFD had created a similar facility, which had limited effects to date in unlocking financing for local banks for renewables projects. Government representatives from the JREEEF fund may consider discussing with international finance institutions such as EBRD to identify options for creating a lending facility that would effectively support local banks' financing for renewable energy (and energy efficiency) projects. In addition, additional analysis could explore policy reforms to build capacity and strengthen Jordan's domestic financial markets, and ability to deliver domestic debt financing to renewable-power projects.

Better communicating about preferential financing from the Central Bank of Jordan

The Government could improve communication and transparency to residential, commercial and industrial consumers on available public incentives schemes to support financing for small- and commercial-scale renewable-power projects through net metering or wheeling schemes. In particular, several financiers have highlighted the need to increase awareness on financing incentives from the Central Bank of Jordan available for renewable energy (and energy efficiency).

Accessing international climate finance

As highlighted in Jordan's *Third National Communication* (2014) and by officials from the Ministry of Environment during interviews conducted in 2016, strengthened capacity building is needed for Jordan to better access international climate financing for renewable energy (Hashemite Kingdom of Jordan, 2014). In particular, Jordan would benefit from increased access to funding available through the Green Climate Fund and other international climate funds. Key suggestions to help Jordan access international climate finance for renewable projects include:

- Increasing resources within the Ministry of Environment to work with the Green Climate Fund, other international climate funds and broader activities on climate finance, possibly thanks to support and capacity building from IFIs and donor agencies; and

- Creating a new unit for accessing international climate finance linked to existing high-level committees at ministerial level. Relevant and existing committees include: the *High Level Green Economy Steering Committee* (HLGESC) at ministerial level, which includes six governmental and non-governmental institutions and reports to the Jordanian Prime Minister; or the *High Level Sustainable Development Committee* (HLSDC), which was established in 2002 and is chaired by the Ministry of Planning and International Cooperation (MOPIC) and co-chaired by the Ministry of Environment (MoEnv).

Scaling up the use of blended and structured finance

Increased used of blended and structured finance is needed to scale up financing for renewable-power projects in Jordan. Blended finance can leverage scarce funding from development agencies and philanthropies to attract private financing to achieve social, environment and economic goals, while delivering financial returns for private investors in line with market expectations (WEF, 2015). Structured finance can help mitigate risk and increase investment volumes for renewable projects by reducing due diligence costs, through various risk-mitigating instruments, including: loan guarantees; PPA guarantee; risk guarantees; aggregated deals; and standardised contracts (IRENA, 2016). In particular, aggregating solar PV projects can improve due diligence process and facilitate access to larger pools of financing (IRENA, 2016). International financial institutions (IFIs) such as the International Finance Corporation (IFC) have often played an important role as lead arranger and lender of record for several aggregated solar projects (such as Shamsuna Power plant), to aggregate projects for syndicated funding, and negotiate on behalf of project developers, banks, government entities and financial advisors (IRENA, 2016).

Future research and IFIs' initiatives could usefully assess opportunities to develop partnerships, funds or other approaches to facilitate blended and structured finance for renewable-power projects in Jordan (OECD, 2015g). Attracting financing from institutional investors might be an option in the long-run, although it is not a realistic prospect in the medium-run given other priorities in the financial sector.

Public governance

Planning for grid extension

One of the main priorities in Jordan is to better plan for grid capacity extension to connect planned and future renewable-power projects to the grid in Jordan. A few rounds of expression of interest for new solar or wind-energy projects were already cancelled due to grid capacity issues (Table A.1.2, Annex A.1). Failure to anticipate the need to expand the grid has resulted in project delays or cancelation. In 2014 alone, the Government cancelled plans to build four solar-power plants funded by Gulf countries with a total capacity of 100 MW, as well as five wind-power plants with a total capacity of 400MW, due to grid capacity constraints (Ghazal, 2014a; Parnell, 2014).

The national electricity grid needs to be strengthened and plans are underway to do so. Currently, the three medium voltage distribution networks in the north (IDECO), middle (JEPCO) and south (EDCO) of the country require PV investors to develop their projects where their power would be consumed. Thus, most investors need to develop their projects in the middle zone, where the majority of the population is located, but where suitable sites are scarce. Projects in the IDECO and EDCO networks, where additional lands can be found, often get cancelled since the generated power cannot be consumed within the networks' geographic coverage.

In order to improve the management of its power grid, the Government could usefully consider adopting additional measures, including:

- **Monitoring actual and projected grid capacity at regular intervals** to ensure that the grid can accommodate new capacity in renewable power;
- **Creating a public, transparent database on grid capacity** for both transmission and distribution across the country. This would notably reduce transaction costs and delays associated with each grid impact study, which can cost around 30 000 JOD and take a few months to conduct;
- **Securing additional funding for new grid improvements and planning grid expansion projects ahead of opening new tender rounds for renewable projects**. This is particularly critical as delays and cancellation of rounds in the renewable-power project submissions to the MEMR have severely hampered renewable deployment in Jordan, according to several project developers and investors, by creating sunk costs, transaction costs and policy uncertainty.

Corporate governance of utilities

The Government could also enhance corporate governance standards of incumbent power utilities. Jordan's transmission and distribution utilities could usefully undergo changes to their management structures and corporate governance by-laws. Such reforms could contribute to grid transmission expansion plans, facilitate interconnection of new power plants, including intermittent wind- and solar-power facilities, strengthen the country's electricity transmission and distribution network, as well as maximise efficiency in the delivery and use of electricity. In addition, Jordan's electricity workforce will need significant training to meet the operational, maintenance and growth demands that investments in Jordan's electricity infrastructure will place on utility companies in the upcoming years (USAID, 2012; Interview with EDAMA, 2016).

Mapping renewable-energy sources

Jordan could map the geographical distribution of renewable-energy resources to improve co-ordination between land use planning and renewable-power infrastructure development. Geographical mapping of resources would help identify which areas may require land-use adjustments to allow for deployment of renewable-power projects.

Improving co-ordination between public authorities, donor agencies and project developers

Co-ordination between donor agencies and the Government is particularly useful to provide technical assistance, capacity building and support on government budget (Interview with NEPCO, 2016). Improved co-ordination between public authorities, donor agencies, development banks and project developers is needed to enhance the effectiveness of policy support to renewable projects. In particular:

- Project developers have claimed that insufficient co-ordination amongst different public entities, especially between the MEMR and NEPCO, was one of the main reasons for delays in the completion of rounds one and two of the direct proposal process, in addition to grid capacity issues, based on interviews conducted with project developers in Jordan in 2015.

- Enhanced communication between project developers and public authorities is also warranted. For example, a few project developers said that they were not fully consulted in the process of the establishment of the JREEEF (Interviews with project developers, 2015; Vivid Economics, 2013).

- Improved co-ordination between the relevant donor agencies and the Jordanian Government is also needed to better align donor projects with Jordanian national priorities on renewable energy investment, and to secure the Government's ownership of the projects. Mapping donors' activities is an important first step to improve co-ordination between existing donor agencies and the Jordanian Government. Table A.1.3 reviews the list of key donor agencies' activities in Jordan in renewable power (and energy efficiency).

- Co-ordination is needed with local authorities, e.g. to ensure than land use planning, building codes and wheeling regulations encourage distributed renewable-power projects in metropolitan areas.

In order to improve co-ordination, the Government could usefully consider further incorporating the co-ordination and development of renewable-power projects within an existing high-level committee at ministerial level, such as the *High Level Green Economy Steering Committee* (HLGESC). This new committee could usefully offer a platform to engage key public and private stakeholders, including the Ministry of Energy and Mineral Resources, the Ministry of Environment, NEPCO, project developers, private financiers, multilateral development banks and donor agencies.

Ensuring policy co-ordination and coherence on renewable power is crucial for enhancing investor confidence and attracting renewable-power investors in the long term. No single government agency in Jordan is responsible for promoting private investment in renewable energy in all sectors, as it is the case of the Moroccan Agency for Solar Energy (MASEN) in Morocco. Jordan's Ministry of Environment (MoEnv) has suggested creating an independent agency that promotes and regulates renewable energy, but the Ministry of Energy and Mineral Resources (MEMR) responded that such an agency would duplicate the roles of the Energy and Minerals Regulatory Commission (EMRC) and the National Energy Research Centre (NERC).

Other policies and cross-cutting issues

Beyond financial resources, other types of resources are needed to design and deploy effectively renewable-power projects in Jordan, while creating domestic jobs and value-added in Jordan. Resources include technological and administrative resources to foster innovation capability and human capacity. In particular, the Government could usefully work with

international financial institutions on workforce development, especially to train and build capacity for government stakeholders, local technicians and engineers involved in construction, operations and maintenance of solar PV and wind-power systems. A few existing programmes aim to train Jordanian government officials and engineers about solar PV systems, for instance by the Norwegian Refugee Council (NRC), in co-operation with Jordan University of Science and Technology (JUST), the European Union (EU) and the Ministry of Energy and Mineral Resources (NRC, 2016).

Policies for promoting responsible business conduct are still scarce and there is a limited awareness in Jordan on green business conduct and initiatives to encourage enterprises to promote it. The concept is relatively new and there is no comprehensive national policy. For example, there is not yet a requirement for systematic disclosure of corporate environmental information, including on GHG emissions and water use. More could be done to promote better corporate environmental performance. (OECD, 2015h, e).

Finally, considering the potential demand for renewable energy in neighbouring countries linked to Jordan by the grid interconnection system, especially Saudi Arabia, Jordan could take a more pro-active approach on encouraging private investors to produce renewable energy for export to other countries in the region.

Notes

1. Special purpose vehicles (SPV) are financial entities created solely to hold specific portfolios of assets or liabilities, which are separated from the balance sheets of corporations or government units.
2. The reference price list provided information for the calculation of electricity purchase prices from renewable-energy sources.
3. In addition, please note that Jordan applies a higher tax rate (24%) on income from electricity generation than the standard corporate income tax rates (20%), which could discourage investment in renewable energy.

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