Adam Smith INTERNATIONAL

FINAL REPORT

Study of mechanisms to incentivize the financial sector to scale up financing of green investment in Jordan

Hashemite Kingdom of Jordan

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In association with:

vivideconomics

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Glossary

ACC – Agricultural Credit Corporation
AFD – Agence Française de Développement
BEERCL – Bulgarian Energy Efficiency and Renewable Credit Line
CARES – Community and Renewable Energy Scheme
CD – certificate of deposit
CEEF – Commercializing Energy Efficiency Finance
CEM – Clean Energy Ministerial
CEO – Chief Executive Officer
CER – Certified Emission Reduction
CFL – compact fluorescent lamp
CORFO – Corporación de Fomento de la Producción de Chile
CSP – concentrated solar power
EBRD – European Bank for Reconstruction and Development
EDP – Executive Development Programme
EE – energy efficiency
EIB – European Investment Bank
ERC – Electricity Regulatory Commission
ESCO – energy service company
FAO – Food and Agriculture Organisation of the United Nations
FDI – foreign direct investment
FEMIP - Facility for Euro-Mediterranean Investment and Partnership
FFEM – Fonds Français pour l'Environnement Mondial
GCC – Gulf Cooperation Council
GDP – gross domestic product
GEF – Global Environment Facility
GGGI – Global Green Growth Initiative
GIB – Green Investment Bank
GiZ - Deutsche Gesellschaft für Internationale Zusammenarbeit
HEECP - Hungary Energy Efficiency Co-Finance Programme
IDARA – Instituting Water Demand Management
IFC – International Finance Corporation
IMF – International Monetary Fund
IPP – independent power producer
JD – Jordanian Dinar
JEDCO – Jordan Enterprise Development Corporation
JLRC – Jordan Loan Guarantee Corporation
JREEF – Jordan Renewable Energy and Energy Efficiency Fund

KfW - Kreditanstalt für Wiederaufbau
kWh – kilowatt hour
LLC – limited liability company
MBA – master of business administration
MENA – Middle East and North Africa
MNRE - Ministry of New and Renewable Energy
MOPIC – Ministry of Planning and International Cooperation
MW – megawatt
MWI – Ministry of Water and Irrigation
NEPCO – National Electric Power Company
NERC – National Energy Research Council
NGO – non-governmental organisation
OECD – Organisation for Economic Cooperation and Development
OPIC – Overseas Private Investment Corporation
PCGG - Presidential Committee on Green Growth
PFM - public finance mechanisms
PPP – purchasing power parity
PV – photovoltaic
R&D – research and development
RE – renewable energy
REIF – Renewable Energy Investment Fund
RSS - Royal Science Society
SIB – Scottish Investment Bank
UK – United Kingdom
UKGI – United Kingdom Green Investments
UNDP – United Nations Development Programmes
UNEP – United Nations Environment Programme
UNIDO – United Nations Industrial Development Organisation
USAID – United States Agency for International Development
S&P – Standard and Poor's
SME – Small and medium-sized enterprise
WAJ – Water Authority of Jordan
WB – World Bank
WEF – World Economic Forum

Executive summary

More and more countries and organisations are exploring avenues for green growth. A green economy is an economy that is low-carbon, climate-resilient, bio-diverse, resource-efficient and socially inclusive, and its basic tenet is that good environmental management is not detrimental to economic growth. Policy makers are interested primarily in three aspects of the green economy: firstly, the prospects for enhancing economic growth, productivity and prosperity on aggregate; secondly, the potential for creating green jobs and increasing employment; and thirdly, the possibility of gaining new areas of comparative advantage in the international market place.

The green economy is crucial to Jordan's current and future prosperity. Jordan has developed its own green growth strategy (Government of Jordan, 2011), which underscores why green growth is an important concept for Jordan. The United Nations Environment Programme (UNEP), in its report 'Towards a Green Economy – A Scoping Study', identifies six sectors as particularly important for Jordan's green economy. They are water, renewable energy and energy efficiency, transport, waste management, tourism and agriculture.

Neglecting the green economy may currently cost Jordan more than 2 per cent of GDP a year in environmental degradation. Furthermore, Jordan's reliance on energy imports, coupled with its low energy efficiency, is also a concern. Jordan relies on imports for 96 per cent of its energy needs, representing, in 2011, 19 per cent of annual GDP. Energy subsidies cost the government 6.25 per cent of GDP per year (IMF, 2012a), and the country has the lowest energy efficiency in the Middle East and North Africa (MENA) region. The same problem is found in the water sector: although water scarcity is of great concern, Jordan being one of the most waster scarce countries in the world, water productivity is below the regional average and water use has risen by 50 per cent in the last 25 years.

There are substantial opportunities for Jordan to pursue green growth, most notably in renewable energy and energy efficiency and in water supply and productivity. Jordan's solar potential is exceptional, and energy investments could reduce energy consumption by 20 per cent over the next 12 years (UNEP, 2011). Water investment – in large bulk water supply infrastructure, wastewater treatment, less groundwater abstraction and lower non-revenue water – could have a substantial impact on water sustainability. Other sectors with potential include transport, waste management, tourism and agriculture.

There has been progress by the Jordanian government in addressing these challenges in recent years. For instance:

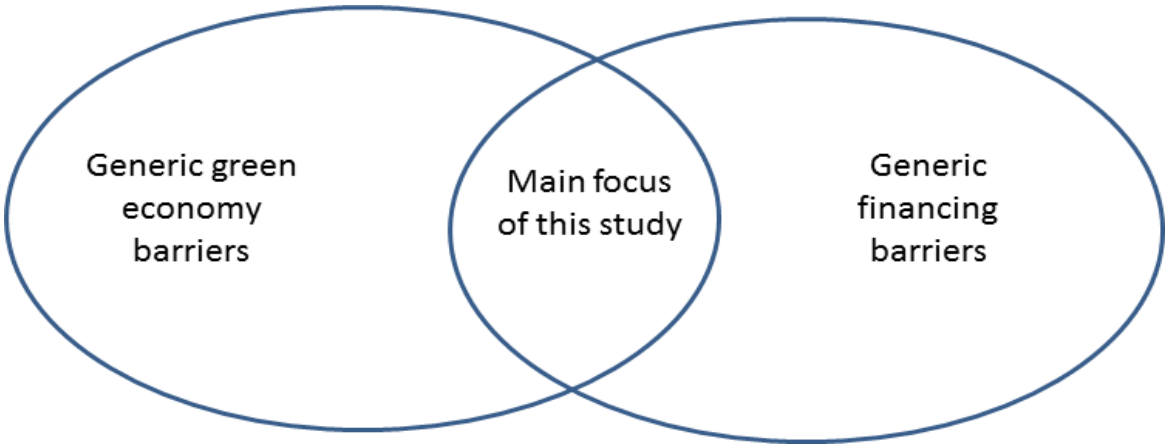
- Initiatives by the Ministry of Environment, the focal point for green economy issues, in all sectors of the green economy.
- The Master Strategy for the Energy Sector, which contains green economy ambitions to put 1,800 MW of renewable energy in place and to reduce energy consumption by 20 per cent by 2020.
- The adoption of the Renewable Energy and Energy Efficiency Law no. 13 in 2012, which establishes a regulatory and financial framework for renewable energy and creates incentives for energy efficiency.
- The development of the Water for Life – National Water Strategy 2008-2022, which aims to improve bulk water supply via investment in large water infrastructure, reduce groundwater abstraction, increase wastewater treatment and raise water efficiency.
- Donor programmes to promote the green economy and improve access to finance including (but not limited to) the Agence Française de Développement's renewable energy and energy efficiency credit line and the United States Agency for International Development's infrastructure and capacity building efforts to improve water efficiency.

To realise green growth opportunities, significant investment will be required in the near term. UNEP (2011) suggests that more than JD 1.3 billion will be required by 2020 to meet a series of objectives in each of the six priority sectors of the green economy. More than 70 per cent of this investment is in the renewable energy and water sectors. The Energy Sector Master Plan identifies even greater renewable energy investment needs of $1,400 to $2,100 million over the period 2008 to 2020 with a further $80 to 150 million required for energy efficiency.

The private sector, and in particular the Jordanian financial sector, has a key role in financing this investment. Jordan's macroeconomic situation (in particular its fiscal position) dictates that a large proportion of the investment will need to be delivered by the private sector. As the bulk of private sector investment in Jordan is financed through domestic Jordanian banks, effectively engaging these stakeholders in the green economy transition is vital – and forms the main focus of this study. Additional green investment will need to be coordinated with existing efforts by development partners.

However, a number of barriers exist to scaling up investment in the green economy. These barriers can be grouped into three categories, as exhibited in Figure 1 below. They are: generic financing barriers that affect all investment; generic (non-financial) factors that restrict the development of the green economy; and then, overlapping with both of them, specific factors relating to the actual financing of green investment.

Figure 1: Barriers to the green economy can be grouped into three categories



Source: Adam Smith International and Vivid Economics

Firstly, there are a number of general investment and access to finance barriers that apply to the whole Jordanian economy rather than just to particular green sectors. They thus inhibit the effective and efficient lending of capital by Jordanian banks to the private sector in its entirety, and would need to be overcome in order to increase lending to those businesses focused on the green economy. Amongst other things, these barriers concern the shortage of lending capacity in the Jordanian banking system, and patterns of lending activity that restrict access to credit for many parts of the economy, such as smaller enterprises.

Secondly, these generic financing barriers are often exacerbated by some of the specific characteristics of green economy projects. They inhibit banks from effectively and efficiently investing in green businesses and projects, and inhibit business from accessing finance of the appropriate sort. They primarily concern the level of familiarity of green economy technologies and practices within banks, the disconnect between financial needs of green projects and businesses and banks' lending rules, and weaknesses within businesses in preparing effective and bankable business plans.

Thirdly, a key feature of the green economy is that is very sensitive to the policy environment. Many aspects of the green economy are currently only profitable as a direct result of policy intervention, and international experience shows that investors feel more confident making long-lived green investments when there are clearly articulated policy goals. Some of the key generic barriers to the green economy in Jordan therefore concern perceptions of evolving and inconsistent government priorities and commitments, policy and regulatory doubt, and uncertainty over the institutional framework. They also concern the level of dialogue between the public and private sector and the level of subsidies provided to fossil fuel energy and water (amongst other commodities).

Overcoming these barriers is the key to unlocking greater green investment in Jordan. The means proposed to unlocking this investment should be linked as closely as possible to the market failures identified. Most of the priority interventions therefore relate to generic and specifically green barriers to investment, but some recommendations concerning the broader enabling policy and institutional environment are also included.

To encourage financing of green investments, the Government of Jordan may want to consider the following activities.

- **Provide technical assistance to both (potential) developers of green projects and financial institutions who appraise them.** This would involve the provision of technical assistance to project developers to develop green businesses and loan applications and for financial institutions to appraise these applications. The need for technical assistance is clearly identified by Jordanian financial institutions and project developers, has been shown to be effective internationally, and is likely to be particularly important given the high predominance of small and medium-sized enterprises (SMEs) in the Jordanian economy. Resources to do this may be available from international development partners.
- **Create a specific green-economy loan guarantee facility.** Loan guarantees ensure that some portion of the loan and interest payments will be repaid if the borrower cannot make the interest or principal repayments. A loan guarantee facility would tackle the high perceived risks that financial institutions have of green investments especially those made by SMEs. International experience demonstrates the effectiveness of this intervention in leveraging private sector investment and there is an existing architecture in Jordan it may be possible to build on. The current presence of loan guarantee providers in Jordan – the Jordan Loan Guarantee Company the Jordan Enterprise Development Corporation – also suggests that this intervention could be introduced relatively easily into the Jordanian context. Funding could come from domestic of international sources.
- **Accelerate the implementation of the Jordan Renewable Energy and Energy Efficiency Fund (JREEEF).** Based on international practice, to become truly effective, the Fund would need:
  - **A substantial injection of resources –** discussions with the Gulf Cooperation Council or other donors over its support to Jordanian renewable energy may be pursued.
  - **To increase its operational independence from government –** the private sector will otherwise be concerned by political interference. This will require a substantial amount of time to come into effect.

  If JREEEF receives sufficient resources then it may also look to provide debt directly to projects if the lending capacity of Jordanian banks continues to be restrictive.
- **Establish a minimum amount that the Agricultural Credit Corporation (ACC) must lend to businesses in sectors of the green economy.** This would involve the creation of a floor for the amount of lending that the ACC must dedicate to green investments in the agriculture sector. The focus on the agriculture sector would be justified by the sector's potential exclusion from the normal banking system coupled with the importance of changed agricultural practices to Jordan's green economy ambitions. The ACC already has two specific subsidised lending windows that have to date been successful. This intervention would relatively easy to implement, and might be implemented at little cost to the government.

These priority interventions would cover all key sectors in the green economy and all sizes of firm. For instance, technical assistance and loan guarantee facilities would be generic across all six sectors of the green economy sectors. The particular focus on JREEEF and the Agricultural Credit Corporation is appropriate given the importance of both the energy and the water sector to Jordan's green economy ambitions. Further, while they would be open to all size of firms, it is likely that the technical assistance and loan guarantee facilities will be particularly important for facilitating SME lending.

To improve the wider policy, regulatory and institutional environment the Government may wish to consider the following recommendations. Both international experience and lessons from Jordan emphasise the importance of overcoming non-financing barriers and making policy and institutional changes as crucial complements to finance-based interventions.

- Create a unit within an influential 'convening' part of government to coordinate government action and provide political leadership on, and clear political commitment to, green economy issues;
- Establish a platform for dialogue between the public and private sector (including the financial sector);

- Reduce subsidies, especially in the energy and water sectors, and replace them with targeted interventions aimed at helping the worst-off households;
- Improve the enforcement of green legislation;
- Support R&D in the green economy;
- Improve the collection of statistics in relation to the green economy

The table below summarises the proposed recommendations and outlines some potential immediate next steps to take these recommendations forward, alongside some of the key agencies for these discussions.

Table 1: Summary of recommendations and potential next steps

Number	Recommendation	Possible immediate next steps	Possible lead agencies
1	Provide technical assistance to both (potential) developers of green projects and financial institutions who appraise them.	i) Open discussions with development partners who may be prepare to provide resources and expertise to such an initiative ii) Undertake a pilot scheme to test demand for such assistance and to identify specific, objective criteria for green projects	- Ministry of Environment - Association of Banks in Jordan - Jordan Enterprise Development Corporation
2	Create a specific green-economy loan guarantee facility	i) Open discussions with development partners who may be prepared to provide resources and expertise to such an initiative ii) Study the feasibility as to whether domestic resources that could support such a scheme iii) Decide on the institutional home for such a scheme	- Central Bank of Jordan - Ministry of Finance
3	Accelerate the implementation of the Jordan Renewable Energy and Energy Efficiency Fund	i) Open discussions with the Gulf Cooperation Council and others on whether they may support the JREEEF ii) Open discussions with potential donor agencies in Jordan and identify legal, structural and administrative barriers for supporting the Fund. iii) Identify ways of providing greater short-term operational independence to JREEEF iv) Identify a legislative timetable for making amendments that would provide greater independence to the JREEEF	- Jordan Renewable Energy and Energy Efficiency Fund - Ministry of Energy and Mineral Resources
4	Establish a minimum amount that the	i) Carry out a detailed market scoping study to	- Agricultural Credit Corporation

	Agricultural Credit Corporation must lend to businesses in sectors of the green economy	identify the market size of green lending in agricultural sector ii) Consult broadly with stakeholders as to how the scheme might work	- Ministry of Agriculture
5	Create a unit within an influential 'convening' part of government to coordinate government action and provide political leadership on green economy issues	i) Nominate an individual or ministry responsible for taking this initiative forward	- Ministry of Environment - Ministry of Planning and International Cooperation - Office of the Prime Minister
6	Establish a platform for dialogue between the unit and private sector (including the financial sector)	i) Identify a 'lead' within government who would be responsible for developing the platform ii) Identify appropriate members of the public and private sector to become members such as the Jordan Investment Association, Association of Banks in Jordan, Jordanian Renewable Energy Society	- Ministry of Environment - Ministry of Planning and International Co-operation - Office of the Prime Minister
7	Reduce subsidies, especially in the energy and water sectors, and replace them with targeted interventions aimed at helping the worst-off households	i) Engage in a broad public debate on the role of subsidies and the impacts of their removal ii) Consult on the appropriate form of compensation for worst-off households	- Ministry of Energy and Mineral Resources - Ministry of Water and Irrigation - Ministry of Finance
8	Where there are existing rules and regulations in support of the green economy, improve their enforcement	i) Strengthen institutional capacity at the Ministry of Environment in terms of licensing and inspection ii) Allocate additional budgetary funds to the Environmental Rangers in the next budget and ensure higher levels of institutional stability and leadership	- Ministry of Environment - Ministry of Finance - Ministry of Industry and Trade
9	Support R&D in the green economy	i) Undertake a study to identify the key challenges to greater green R&D in Jordan and appropriate policies and mechanisms that would best overcome these challenges ii) Restructure and empower the R&D Fund at the Ministry of Higher Education	- Ministry of Environment - Ministry of Higher Education

10	Improve the collection of statistics in relation to environmental performance and the green economy	i) Improve the collection, accuracy and coordination of data relevant to the green economy ii) Ensure its dissemination and use with government, private sector and civil society decision-making processes	- Environmental Statistics Division in the Department of Statistics

1. Introduction

This is the final report for the joint Adam Smith International / Vivid Economics 'study of mechanisms to incentivize the financial sector to scale up financing of green investment in Jordan'. The overall aim of the study is to identify the barriers associated with private sector financing of 'green economy' activities in Jordan. The study also proposes possible ways to overcome these barriers, drawing, where appropriate, on experiences in other countries. The decision to undertake this study was taken in 2010 by Jordan's Prime Minister and Ministry of Environment following a Green Financing Seminar held by the Ministry of Environment and the Association of Banks of Jordan. It also follows a Scoping Study – Towards a Green Economy carried out by the United Nations Environment Programme (UNEP) in partnership with the Ministry of Environment carried out in 2011.

There are a number of drivers that illustrate the urgency of greater 'green' investment in Jordan.

- In contrast to its neighbours, Jordan has limited fossil fuel resources. It imports more than 96 per cent of its energy sources, which in 2011 accounted for 19 per cent of annual GDP (IMF, 2012b). Energy is also heavily subsidised, accounting for 6.25 per cent of GDP (IMF, 2012a), and the country has the highest energy use per GDP in the Middle East and North Africa (MENA) region.
- Jordan faces acute water shortages with one of the lowest rates of per capita water resources in the world and predictions that there could be absolute water shortages by 2025 (Ministry of Water and Irrigation, undated). Water use has increased by 50 per cent in the last 25 years. Despite this, Jordan has below average water productivity for the MENA region.
- Jordan presents substantial opportunities for green growth and investment, most notably in renewable energy, energy efficiency and water efficiency. Jordan's solar potential is exceptional, and energy investments could reduce energy consumption by 20 per cent over the next 12 years (UNEP, 2011). Water investment could have a substantial impact on improving water productivity. Other sectors with potential include transport, waste management, tourism and agriculture.

There has been progress in addressing these challenges in recent years. For instance:

- Initiatives by the Ministry of Environment, the focal point for green economy issues, in all sectors of the green economy.
- The Master Strategy for the Energy Sector, which contains green economy ambitions to put 1,800 MW of renewable energy in place and to reduce energy consumption by 20 per cent by 2020.
- The adoption of the Renewable Energy and Energy Efficiency Law no. 13 in 2012, which establishes a regulatory and financial framework for renewable energy and creates incentives for energy efficiency.
- The development of the Water for Life – National Water Strategy 2008-2022, which aims to improve bulk water supply via investment in large water infrastructure, reduce groundwater abstraction, increase wastewater treatment and raise water efficiency.
- Donor programmes to promote the green economy and improve access to finance such as the Agence Française de Développement's (AFD) renewable energy and energy efficiency credit line, the United States Agency for International Development's (USAID) infrastructure and capacity building efforts to improve water efficiency and the European Union's (EU) budget support loan in support of renewable energy and energy efficiency.

However, much remains to be done if Jordan is to realise its green economy ambitions. According to UNEP (2011) JD 1.3 billion will be required by 2020 to meet Jordan's green economy ambitions. An integral component of reaching these capital requirements will be to encourage capital markets, especially commercial banks, to increase the amount of capital that is allocated towards this part of the economy so that the substantial investment needs can be met. To do this will in turn require a suitable set of policies, incentives and skills to be in place. This study is intended to make practical and actionable recommendations on how to further improve the green economy investment environment.

The remainder of this report is structured as follows:

- Section 2 discusses the context of the green economy in Jordan and the rest of the world, looking at especially at the broader benefits it brings and the challenges it can overcome.
- Section 3 looks at the economic and sector-specific context in Jordan, focusing on macroeconomic conditions, the banking sector and the energy and water sectors.
- Section 4 examines the barriers to green growth and investment in Jordan, related to both finance and the policy and regulatory environment.
- Section 5 offers a series of recommendations on how to overcome these barriers, including a small number of priority recommendations for the Government of Jordan and its partners to take forward.
- Section 6 presents four case studies of existing or planned programmes or actions that have been or will be implemented in other countries to promote a green economy, all which can offer lessons for Jordan.
- Section 7 makes a series of broader, non-financing recommendations for Jordan, in particular relating to the policy, regulatory and institutional environment.

2. The green economy in Jordan and the world

More and more countries and organisations are exploring avenues for green growth. The concept of green growth or more broadly the green economy has gained much traction in recent debate. It is of interest to both developed countries and developing countries, and has been much discussed in international fora such as the G20 and the 'Rio+20' United Nations Summit in June 2012 (Jacobs, 2013). The World Bank, the Organisation for Economic Cooperation and Development (OECD) and the United National Environment Programme (UNEP) all have extensive analysis and support programmes (OECD, 2011; UNEP, 2011; World Bank, 2012a, 2012b). A new international organisation, the Global Green Growth Institute (GGGI), is explicitly devoted to the promotion of a green economy. A 'Green Growth Knowledge Platform' has been set up for interested parties to share their experience.[1]

A green economy is an economy that is low-carbon, climate-resilient, bio-diverse, resource-efficient and socially inclusive. There are many definitions of green growth. More cautious proponents simply assert that sound environmental management is consistent with long-run economic growth. Others claim more boldly that environmental policy can be a driver for growth (Jacobs, 2013). What both have in common is that they emphasise the link between good environmental management (low-carbon growth in particular) and economic prosperity. The above definition from Bowen and Fankhauser (2011) captures the salient points.

For operational purposes, the green economy concept is very similar to sustainable development. There are subtle conceptual differences between green growth and sustainable development. The green economy discourse pays more attention to economic factors, while sustainable development emphasises environmental and social aspects equally (and perhaps more). The green growth debate has an (overly) strong focus on climate change, while at the core of environmentally sustainable development is the management of scarce natural resources. However, for the practical purposes of environmental policy, and for the purposes of this study, the two concepts are essentially interchangeable.

This section recapitulates the theoretical and practical motivations for Jordan and other countries to participate in the emerging green economy. It is divided into three sections:

- Section 2.1 discusses why green growth is attracting international attention
- Section 2.2. explores the particular salience of green growth to Jordan
- Finally section 2.3 provides the available evidence on the investment costs of moving towards a green economy

2.1. Why is green growth attracting attention internationally?

Policy makers are interested primarily in three aspects of the green economy. They are firstly the prospects for economic growth and prosperity on aggregate, secondly the potential for green jobs, and thirdly the possibility of gaining new areas of comparative advantage in the international market place.

The basic tenet of a green economy is that good environmental management is not detrimental to economic growth. While the empirical basis to substantiate this claim is still weak, there are four conceptual reasons why a green growth strategy might boost economic prosperity, both under current economic circumstances and in the longer term (Bowen and Fankhauser, 2011). Environmental policies may promote growth and productivity because:

- In the short term environmental investment into renewable energy, water supply and other green infrastructure may give a Keynesian stimulus to an ailing global economy that is held back by a lack of demand (Barbier, 2010a, 2010b). Fiscal constraint will in many cases prevent big public investment programmes, but many green infrastructure projects could, in the right policy context, be open for private investment (Zenghelis, 2011).

1 See : http://www.greengrowthknowledge.org/Pages/GGKPHome.aspx

- Over the medium term the removal of market failures and investment barriers associated with green investment could create economic systems that are not only greener but also economically more efficient. Examples of frequent market and policy failures that affect both the economy and the environment include harmful subsidies for energy and water, the insufficient regulation of pollution and impediments related to innovation. Environmental damage can often lead to a decline in productivity. However, the removal of these impediments to stimulate productivity is not easy and will in many cases have to be accompanied by flanking measures to mitigate unwanted side-effects, for example on poor population groups.
- In the longer-term the promotion of green growth might stimulate productivity gains and innovation, akin to a new industrial revolution (Stern and Rydge, 2012). The basis of this claim tends to be the historical observation that economic growth is often driven by "waves" of technological change that trigger wider economic restructuring, productivity gains, investment and innovation (Perez, 2010). Examples of green investments with this capacity include smart energy systems, new agricultural production techniques and perhaps new forms of transport and electricity generation.
- Perhaps even further into the future, a green economy might help to overcome otherwise binding constraints on the availability of resources like oil, gas and minerals. The advent of unconventional energy resources like shale gas has taken the edge off concerns about peak energy. However, the issue of energy security remains alive. This is especially the case in Jordan where reliance on Egyptian gas has become a huge issue following the interruption of supply. Internationally, there is also concern about potential shortages in other raw materials such as phosphorus (Grantham, 2012).

In addition, many policy makers are interested in the employment prospects of the green economy. Statistics from the energy sector show that low-carbon energy, and renewable in particular, are much more labour intensive than conventional forms of energy. According to one study, solar photovoltaic (PV) requires seven to ten times as much labour as conventional coal and gas. Wind and biomass could be up to three times as labour intensive (Kammen et al., 2006).[2] Particularly in countries with a young and growing labour force, such as Jordan, these statistics are, at face value, attractive.

However there are some important complications when it comes to estimating the employment impact of the green economy. Four issues in particular are worth highlighting, although in some cases there are reasons to suspect that these caveats are less significant for Jordan:

- First, there will also be short-term costs if there are labour market rigidities. Coal miners do not become solar energy experts overnight. Rigidities may be less of a problem in a country like Jordan, with a young, flexible work force.
- Second, high-labour intensity may mean that the value and importance of any one worker is relatively low (that is, low labour productivity) which, in turn, may imply low wages. Further, over time, we would expect renewable energy in particular to become cheaper, which will mean less labour input.
- Third, jobs may occur at different stages in the value chain. This may work in Jordan's favour. Coal jobs for example are predominantly upstream, in coal mining; wind jobs are in the construction and engineering (Pew Research Centre, 2011). Jordan imports its coal, but a larger share of renewable jobs may be located in Jordan.
- Fourth, the high costs of some green economy technologies can have detrimental effects on economic competitiveness and prices. This is particularly an issue for renewable energy and some water

2 The calculations account for differences in load factor, that is, the fact that renewable energy plants can only operate for a fraction of the time that conventional power stations do.

technologies like desalination. In contrast, energy and water efficiency lead to lower costs. However, current energy generation costs in Jordan are already exceptionally high.

A final attraction of a green economy is the possibility to create new export opportunities and areas of comparative advantage. Particularly in a world that is moving globally towards more environmentally-friendly forms of production it is important for countries to be at the vanguard of green technological change. It would not pay off to be a high-carbon producer in a low-carbon world. A growing number of countries are recognising this and have started to position themselves in the green economy. Prominent examples include:

- China, which in its 12th Five Year Plan identifies seven sectors of strategic importance in the green economy (such as renewable energy, new materials and clean cars) that it wants to expand over the coming decade to create a $1.5 trillion green economy (Stern, 2010, 2011);
- South Korea, which has explicit green economy laws, passed with a view of making the country a leader in the green economy (Korean Ministry of Government Legislation, 2010);
- OECD countries like Japan and Germany, whose leading firms are investing heavily in green innovation in strategic sectors such as car manufacturing (Fankhauser et al., 2012).

2.2. Why is green growth important to Jordan?

The green economy is crucial to Jordan's current and future prosperity. Jordan has developed its own green growth strategy (Government of Jordan, 2011), which underscores why green growth is an important concept for Jordan, and why the government has started discussions with GGGI on green growth planning.[3] The UNEP report identifies six sectors as particularly important for Jordan's green economy. All six are also of crucial importance to Jordan's prosperity more generally. They are:

- Water;
- Renewable energy and energy efficiency;
- Transport;
- Waste management;
- Tourism;
- Agriculture.

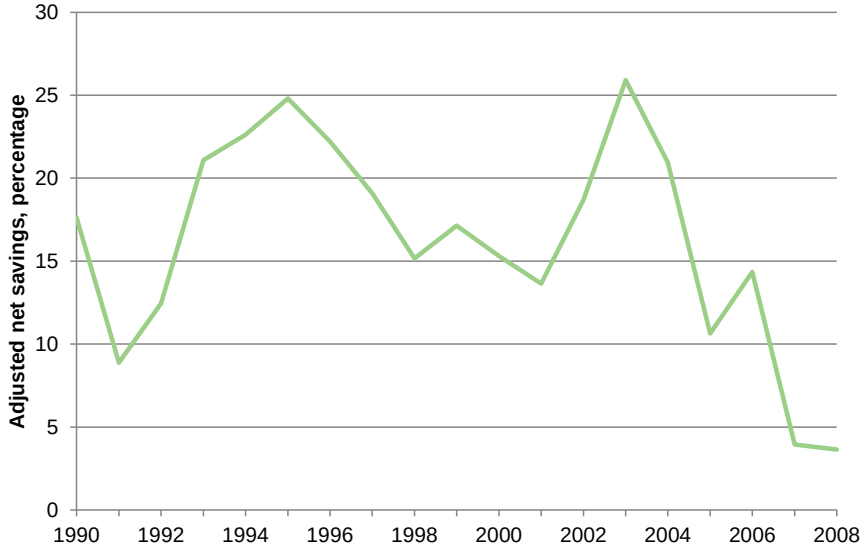
Environmental degradation may currently cost Jordan more than 2 per cent of GDP a year. A World Bank study (World Bank, 2009) estimated that the cost of environmental degradation to the Jordanian economy – measured in terms of mortality and morbidity from air and water pollution, foregone income of activities linked to natural resource use (such as agriculture and tourism), and the cost of 'aversive behaviour' (e.g. the purchase of bottled water to reduce exposure to water-borne diseases) – was equivalent to 2.4 per cent of GDP in 2006, rising to almost four per cent if global environmental impacts from Jordanian activities were taken into account. This is driven primarily by air pollution (1.2 per cent of GDP) and inadequate water supply and hygiene (0.8 per cent of GDP).

Furthermore, movements towards green growth are likely to demand a broader conception of economic progress than provided by GDP: the (imperfect) measures that are currently available suggest that there are some risks to the sustainability of the Jordanian economy. A key characteristic of the gross domestic (or national) product metrics are specifically that they are 'gross' metrics; in measuring economic activity in Jordan/flows of income to Jordanian citizens, they fail to account for changes in the value of assets (depreciation) that are supporting this activity. This leads to the possibility that current levels of economic activity are only being achieved through a decline in the assets (and hence future income generating potential) of the Jordanian economy. One metric that tries to explicitly link environmental and economic

3 See: http://en.openei.org/wiki/GGGI-Jordan_Green_Growth_Planning

performance is that of *adjusted net savings*. This is a measure that tries to capture the extent to which an economy is either accumulating or running down its stock of assets (wealth), recognising that the stock of assets is not limited just to physical capital, but should also capture the decline in natural resources and the extent to which natural resource depletion is being accompanied by a growth in other assets. It also captures damages to assets caused by pollution[4]. A negative value implies that the economy is unsustainable, as wealth is declining, and future generations will have lower welfare than current generations. As figure 2 below shows, although Jordan has a net savings above 0 per cent, it has declined rapidly in recent years.

Figure 2: Jordan's adjusted net savings metric is on a clear downward trend



Source: World Development Indicators

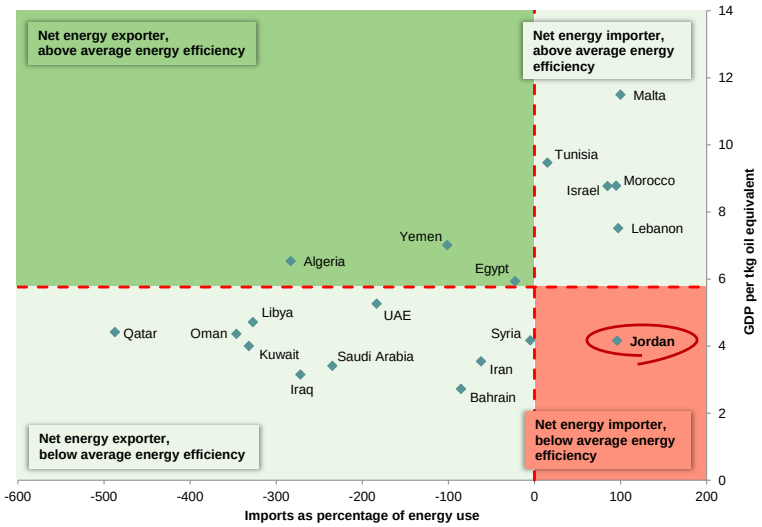
Jordan's reliance on energy imports, coupled with its low energy efficiency, is a particular concern. Jordan relies on imports for 96 per cent of its energy needs, representing, in 2011, 19 per cent of annual GDP. This vulnerability is likely to be exacerbated by the substantial increase in forecast energy demand of 5.5 per cent per year between 2008 and 2020. The recent challenges it has faced in importing gas from Egypt, and the substantial increase in electricity generation costs that this has resulted in, has illustrated the fragility of the current energy supply situation. Furthermore, the energy that it does import is used inefficiently, with the primary energy use per dollar of GDP (constant, 2005 prices, adjusted for purchasing power parity (PPP)) significantly below the regional average: Lebanon generates almost 80 per cent more GDP from every tonne of oil equivalent energy use than Jordan. This is driven to some extent by the concentration of energy intensive heavy industries based in Jordan such as the cement and phosphate industries. Figure 3 shows the confluence of these factors: Jordan is the only net importer of energy in the MENA region with a below average energy efficiency.

The same problems are found in the water sector: although water scarcity is of great concern, water productivity is below the regional average. UN Food and Agriculture Organisation (FAO) data suggests that Jordan's renewable water resources per capita are the eleventh lowest in the world at just 148 m^3 per person per year in 2011 (FAO, 2012), and are predicted to fall to 90 m^3 by 2025 if supply remains constant. By contrast, a country is considered water poor if it has less than 1,000 m^3 per person per year. Jordan suffers from periodic droughts lasting for four to five years, and surface water supply has fallen sharply over the past ten years, due in part to reduced rainfall (USAID, 2012). Despite this, national water use increased by 50 per cent between 1985 and 2005 and is expected to increase further under the

4 *There are also a number of further resources that are not captured by the World Bank statistics, notably water resources, that would also ideally be included in this metric.*

pressure of population growth (Ministry of Energy and Mineral Resources, undated). Extensive abstraction and over-pumping of groundwater supply by the public and private sector have depleted water resources beyond the natural recharge capacity (USAID, 2012). Around forty-three per cent of water supplied is either lost as leakage or not paid for which helps to explain Jordan's low water productivity (Ministry of Agriculture, 2012). Rainwater harvesting in rural and urban areas has been limited and have had little impact. As Figure 4 below shows, Jordan is in the sub-set of countries in the Middle East and North Africa region with below average water resources but despite this, below average water productivity.

Figure 3: Jordan is the only country in the MENA region that is both a net importer of energy and uses above average amounts of energy to produce its GDP



Note: GDP measured in constant 2005 prices using PPP exchange rates. Energy use relates to primary energy use.

Source: Vivid Economics based on World Bank and International Energy Agency.

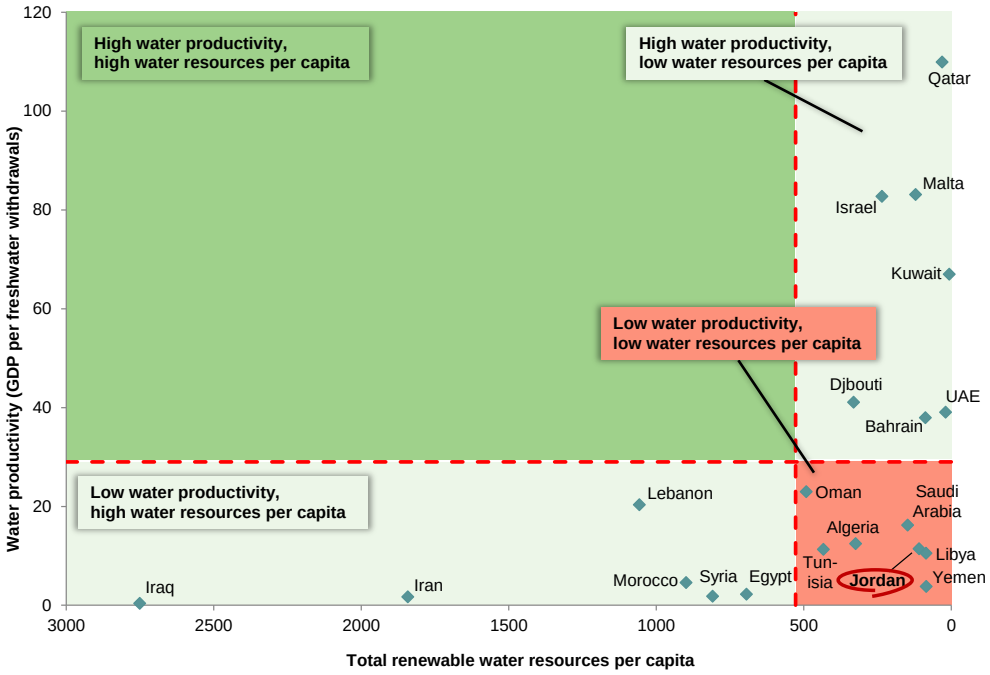
Jordan has taken some important first steps in addressing these green growth issues. Most notable of all is the creation of the Green Economy Strategy by UNEP/Ministry of Environment (UNEP, 2011), discussed above, which identifies the sectors that offers the greatest potential to transition towards a green economy (see section 2.3 below). In addition, the Ministry of Environment was given the authority of inspection and enforcement of environmental regulations under the Environmental Protection Law No. 25 of 2006, while in June 2006, Jordan launched the Environmental Rangers Directorate to organize compliance inspection. Complementing this 'stick,' the Jordan Environmental Fund has been created by the Ministry of Environment to support public and private sector investment in projects that improve the environment, rehabilitate degraded ecosystems and ensure the sustainability of the country's natural resource. USAID also projects that the residential and commercial green building sector in Jordan will achieve growth above 20 per cent per annum over the next five years (OECD, forthcoming).

However, there are also substantial opportunities for Jordan to further pursue green growth, most notably in renewable energy and energy efficiency. For instance, in terms of renewable energy sources, the solar potential of Jordan is near-unrivalled – Jordan receives 5 to 7 kilowatt hours (kWh) per m^2 of solar radiation per day and around 300 days of sun per year – and there is good wind potential (for example in the Jordan Valley and Wadi Araba off the Dead Sea and Gulf of Aqaba) (Jordan Europe Business Association, 2009). There is also potential for using municipal solid waste to create biogas which can simultaneously lead to air pollution improvements. According to UNEP, investments in energy conservation could reduce energy consumption by twenty per cent over the next 12 years (UNEP, 2011). A study by the National Energy Research Council (NERC), examining the potential for energy efficiency measures for ten Jordanian enterprises (including hotels, banks, and a health centre) estimated an average payback period of as little as 1.6 years on investments that would save 20 per cent of energy use (OECD, forthcoming). Likewise, the Jordan Investment Board has suggested that there are numerous energy efficiency and renewable energy projects with rates of return in the region of 10 to 15 per cent (Jordan Investment Board, 2010).

Further opportunities exist outside these key sectors. For instance, organic farming has the potential to significantly improve agricultural production, and replenish soil nutrients, hence diminishing the environmental impact of conventional farming (OECD, forthcoming). It can also reduce the amount of water use needed for agriculture which is significant given that this sector accounts for around two thirds of water use in Jordan. Further improvements in increasing agricultural water productivity are available through crop conversion and production intensification while there may be simultaneous renewable energy and water efficiency improvements obtainable through the development of solar energy in the Highlands (USAID, 2012). The OECD also reports substantial opportunities to exploit eco-tourism in regions such as the Badia area and Jawa. Although they have not been examined to date, and such examination is outside the scope of this study, there may also be opportunities in high value industries like pharmaceutical and information communication and technology.

Previous analyses have illustrated that seizing these opportunities could also bring macroeconomic benefits to Jordan. The UNEP 'Towards a Green Economy' Scoping Study identifies that progress towards green growth in six sectors could realise more than 50,000 new jobs in Jordan, although these estimates have not been independently verified as part of this study.

Figure 4: Jordan is both short of water and uses what water it has inefficiently



Source: Vivid Economics based on World Development Indicators database and UN FAO Aquastat database

2.3. The investment challenge for Jordan's Green Economy

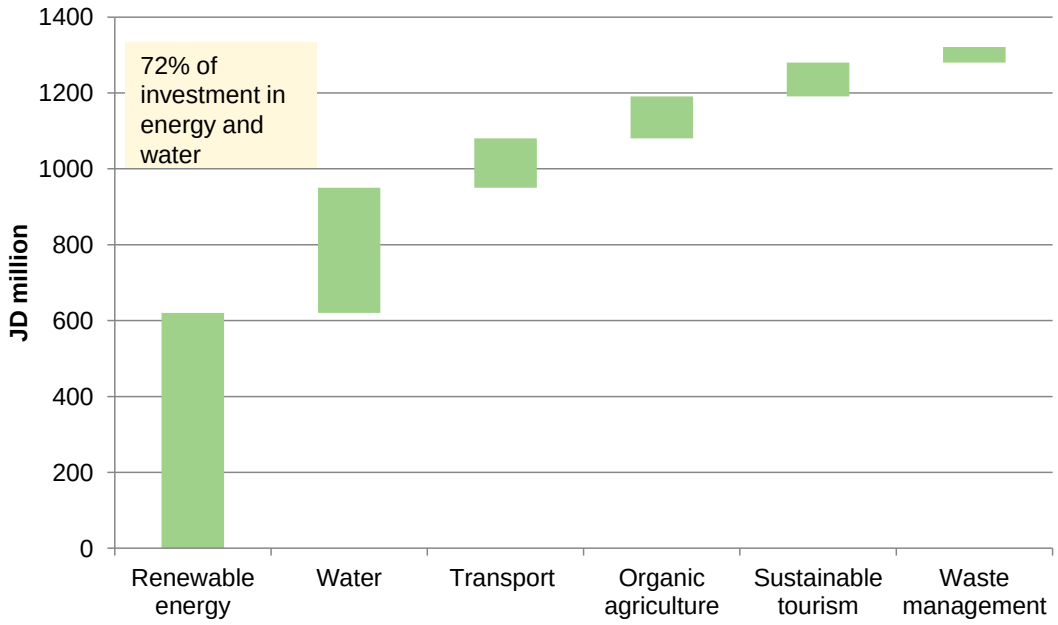
To realise green growth opportunities, significant investment will be required in the near term. Figure 5 below, developed using data from the UNEP Scoping Study, suggests that more than JD 1.3 billion will be required by 2020 to meet a series of objectives in each of the six priority sectors of the green economy. More than 70 per cent of this investment is estimated to be needed in the renewable energy and water sectors.[5] Other studies suggest similar, or even higher, investment needs. For instance, the Energy Sector Master Plan identifies a renewable energy investment need of $1,400 to $2,100 million over the period 2008 to 2020 with a further $80 to 150 million required for energy efficiency.

5 The UNEP Scoping Study is unclear as to whether this also includes energy efficiency investment.

The private sector, and in particular Jordanian banks, will have a key role in financing this investment. As discussed more fully in the next section, the macroeconomic context of Jordan dictates that a large proportion of the investment will need to be delivered by the private sector. As the bulk of private sector investment in Jordan is financed through domestic Jordanian banks, engaging these stakeholders in the green economy transition is vital.

Additional green investment will need to be co-ordinated with existing efforts by development partners. A number of development partners, such as the Agence Française de Développement (AFD) the US Agency for International Development (USAID), KfW, the United Nations Development Programme (UNDP), European Bank for Reconstruction and Development (EBRD) and the European Union (EU) are already supporting green economy efforts in Jordan. This provides both an important evidence base on what is working, and what is not, as well as an opportunity from which new initiatives may be leveraged. At the same time, for Jordan to make a long-term sustainable transition to the green economy will ultimately require the 'domestication' of policies and incentives.

Figure 5: Jordan's green economy investment needs to 2020 may exceed JD 1.2 billion



Source: Vivid Economics based on UNEP 'Towards a Green Economy in Jordan' Scoping Study

3. The context for increasing financing towards green growth activities in Jordan

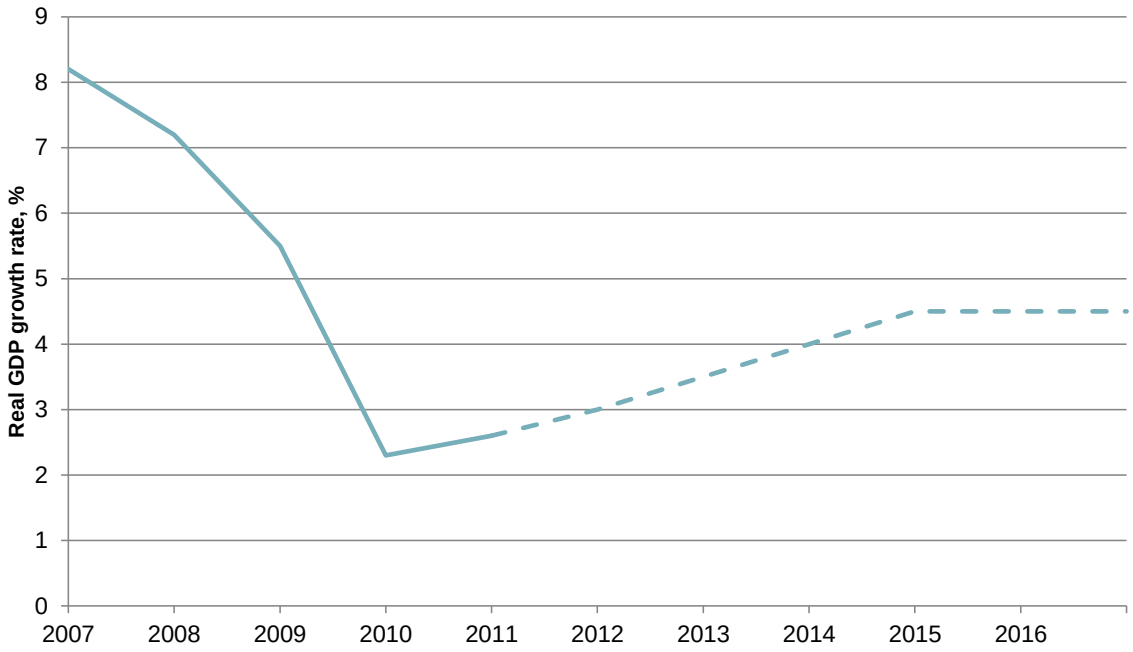
The appropriate policies to stimulate greater financing to help meet a country's green growth investment challenges depend on the country context. There is no one universally appropriate set of recommendations. Therefore this section sets out our understanding of the current situation in Jordan, which we have taken into account in developing our recommendations. It is divided into three main sub-sections.

- Section 3.1 sets out the current macroeconomic climate in Jordan, recognising that this broader context will shape both the urgency for the move towards a green growth path as well as constraints and opportunities that will make this more or less difficult
- Section 3.2 sets out the current state of the banking sector in Jordan. The key thrust of our study is to stimulate greater lending towards green activities by Jordanian banks. As such, understanding the current performance of the sector is vital in informing such recommendations
- Section 3.3 sets out our understanding of the existing suite of policies and incentives in support of green growth in Jordan, with a particular focus on the energy and water sectors.

3.1. The macroeconomic situation in Jordan

Jordan is a moderately competitive, open economy that depends highly on energy and commodity imports as well as receipts from tourism, remittances and international aid. Jordan went through a period of significant economic growth since 2000 but has experienced difficulties recently. Jordan's GDP had been steadily growing at around 8 per cent per year in the middle part of the last decade but, following the financial crisis, it declined fast to levels slightly above 2.5 per cent, with only moderate improvements forecast. At the same time, government debt is currently rapidly increasing (following a rapid decline between 2000 and 2008), unemployment remains at high levels and foreign direct investment is falling. In the short term, Jordan's priorities are to grapple with the increased costs of imported fuel and a decrease in foreign direct investment (FDI), remittances and tourism receipts and the resulting current account deficit. In the medium to long term, reducing the government deficit and decreasing chronic unemployment along with improving the private sector business environment pose challenges to Jordan's growth.

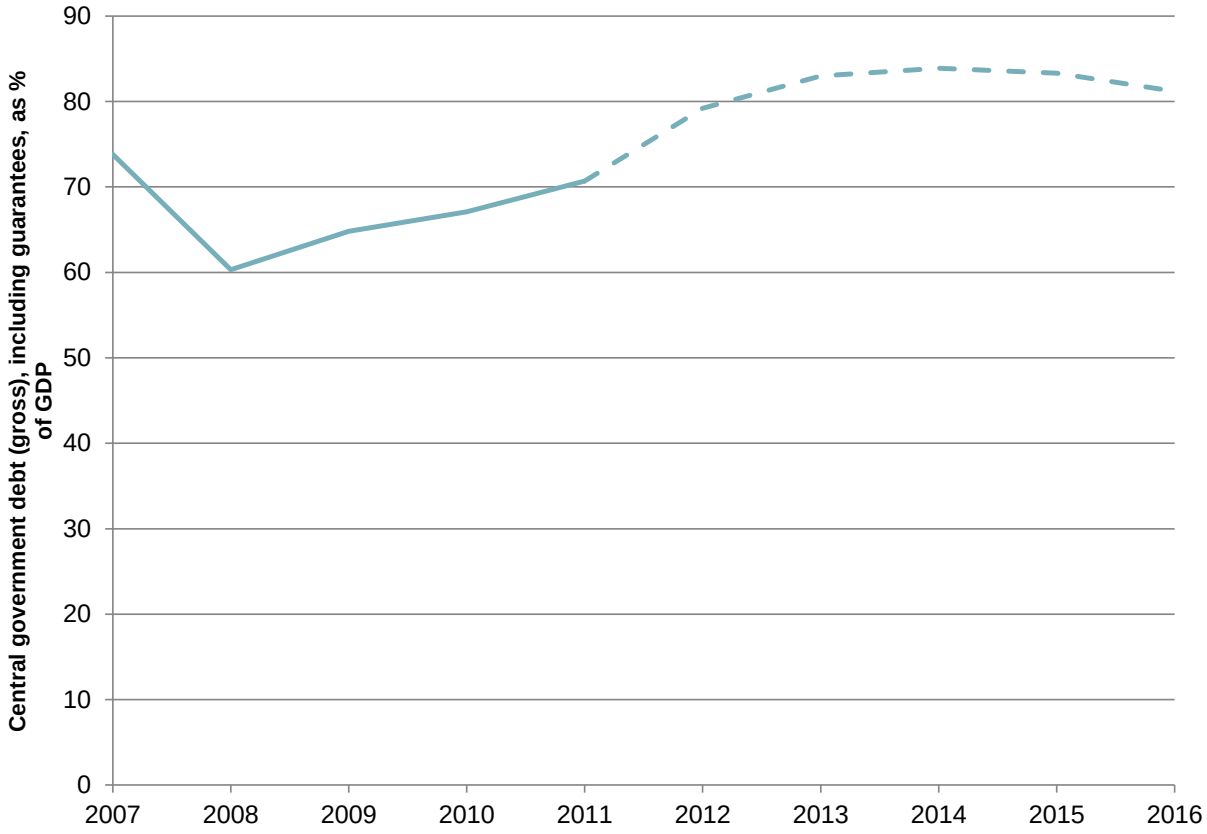
Figure 6: Jordan's GDP growth rate declined rapidly in the last few years and is projected to recover only moderately



Source: Vivid Economics based on World Development Indicators and IMF (2012b)

These recent challenges reflect Jordan's vulnerability to external shocks. As discussed in Section 2, Jordan imports almost all its energy, as well as a substantial part of agricultural products such as grain and is therefore exposed to price volatility in these markets. The financial crisis, a surge in the oil price and turmoil in Egypt during the Arab Spring have all contributed to a significant rise in import prices. In particular, the problems in Egypt have required Jordan to switch the fuel it uses for power production away from gas and towards much more expensive fuel oil and diesel. Indeed, in 2011 alone, Jordan experienced a 13 per cent decline in its terms of trade (IMF, 2012a). Furthermore, Jordan relies heavily on FDI, remittances, tourism and grants: according to the World Bank's World Development Indicators, remittances alone can account for up to 20 per cent of GDP. In the aftermath of the financial crisis, remittances have decreased sharply and the Arab spring, along with the continuing political risk in neighbouring countries, has resulted in a decrease in tourism receipts.

Figure 7: Jordan's government debt levels have increased since 2008



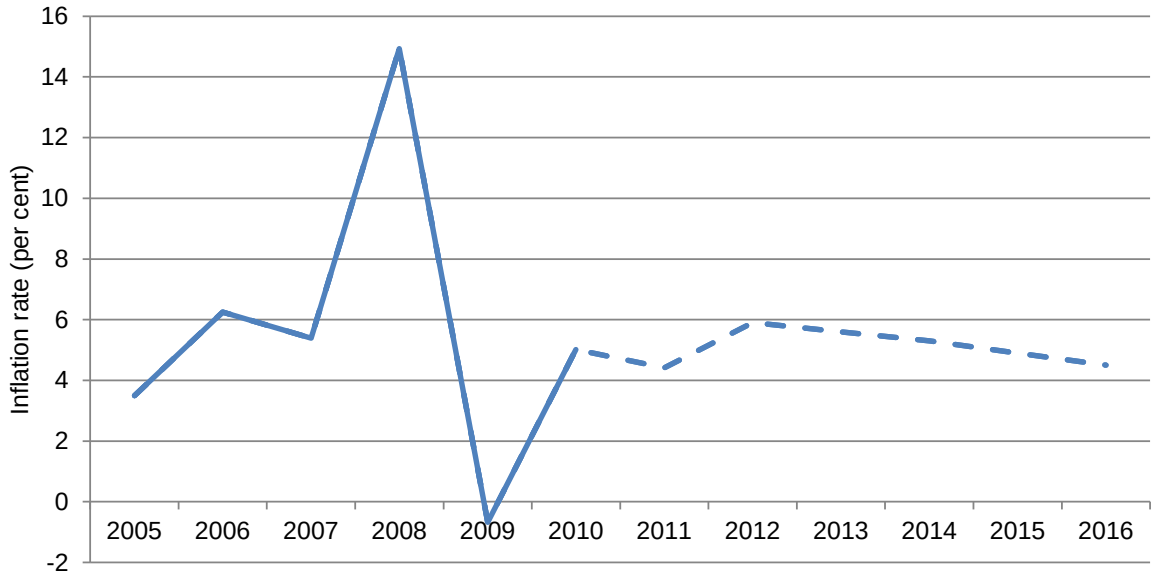
Source: IMF (2012a)

These external shocks have had a damaging impact on the government's fiscal position. The government budget depends in large parts on the amount the level of FDI, remittances and tourism receipts as well as on the amount of various subsidies (OECD, 2011). The International Monetary Fund (IMF) estimates that a temporary reduction of 20 per cent in FDI, remittances and tourism receipts will increase the government budget by up to 10 per cent that year (IMF, 2012a). Furthermore, until recently, the government has largely sheltered the Jordanian population from the increase in imported energy costs through increasing subsidies: the IMF (2012a) states that energy subsidies account for 6.25 per cent of GDP, and Saudi Arabia contributed approximately $1.4 billion in 2011 alone to help fund fuel subsidies, which prevented an increase of the government deficit by six percentage points (IMF, 2012a). The IMF has also recently provided a $2 billion IMF loan to aid with increased debt servicing and higher energy import prices, although this has come with a requirement to reduce fossil fuel subsidies. As a result of these challenges, government debt levels have increased substantially in recent years, and are projected to increase further as shown in Figure 7.

The shocks have also weakened the country's current account, although the government has not changed the exchange rate peg. The increase in imported energy prices have led to Jordan's current account deficit expected to fall to around 9.5 per cent of GDP in 2011. This risks challenges for the government deficit by potentially harming the credit rating as well as potentially destabilising the Jordanian Dinar peg (which, to date, has remained fixed at JD 0.709 per US Dollar). Despite this, the IMF anticipates that the current account deficit will fall with increased gas import stability from Egypt and signs of a global recovery (IMF, 2012a). However, there are substantial downside risks to this projection related to an increase in global commodity prices or continued turmoil in the region.

Inflation is expected to stabilise at moderate levels due to a tightened monetary stance. In the wake of the financial crisis in 2008 and 2009, inflation in Jordan was very volatile, peaking at approximately 15 per cent in 2008 before turning slightly negative in 2009. Sound monetary policy and the fixed exchange rate have helped to result in a stabilisation around five per cent in 2010. A decline in fossil fuel subsidies and therefore increased cost pass through of oil and other energy prices is projected to result in a slight increase to six per cent before the inflation rate slowly declines over time (IMF, 2012a).

Figure 8: Inflation has been very volatile in the past but is projected to stabilise between four and six per cent



Source: Vivid Economics based on World Development Indicators and IMF

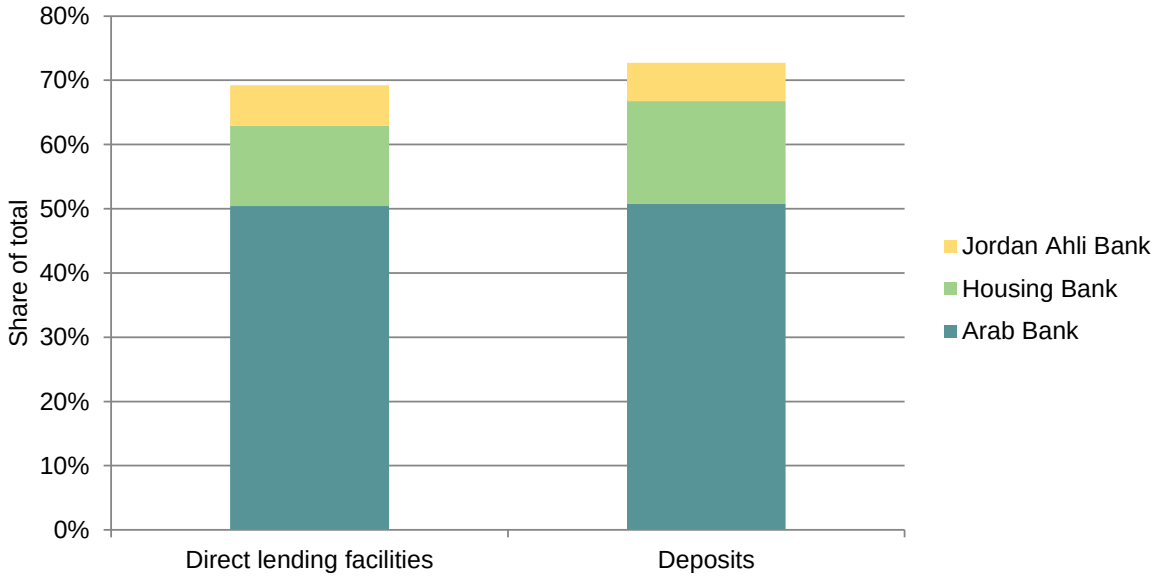
Although Jordan has a well-educated work force, structural difficulties result in a persistently high unemployment rate, especially for the young, with consequences for social stability. Almost 30 per cent of the Jordanian workforce possesses a tertiary degree, yet, according to the World Development Indicators, unemployment has been persistently high at around 13 per cent. The recent crisis increased unemployment in general and especially for the young. Unemployment in the age group 20 to 24 inclusive is over 27 per cent according to the Jordanian Department of Statistics.

Jordan is ranked mid-table in both the World Economic Forum (WEF) and the World Bank (WB) indices of competitiveness and ease of doing business. The country is positioned 64th (out of 144 countries) in the WEF Competitiveness Report (WEF, 2012) .with string scores on aspects like health and primary education but weak scores on aspects of macroeconomic environment, especially the government budget balance (WEF, 2012). The World Bank's 2012 Ease of Doing Business index ranks Jordan in a broadly similar relative position – 106th out of 183 countries – with strong performance on getting electricity, paying taxes and trading across borders – but much weaker performance in getting credit and enforcing contracts (World Bank, 2012).

3.2. The Jordanian banking sector

The banking sector is an important pillar of the Jordanian economy. It contributed, together with the insurance sector, some 11.6 per cent to GDP in 2011. Since 2000, growth in the sector has been significant, with the consolidated balance sheet of licensed banks rising from JD 14.15 billion in assets in 2000 to JD 37.69 billion at the end of 2011 (Jordinvest, 2012).

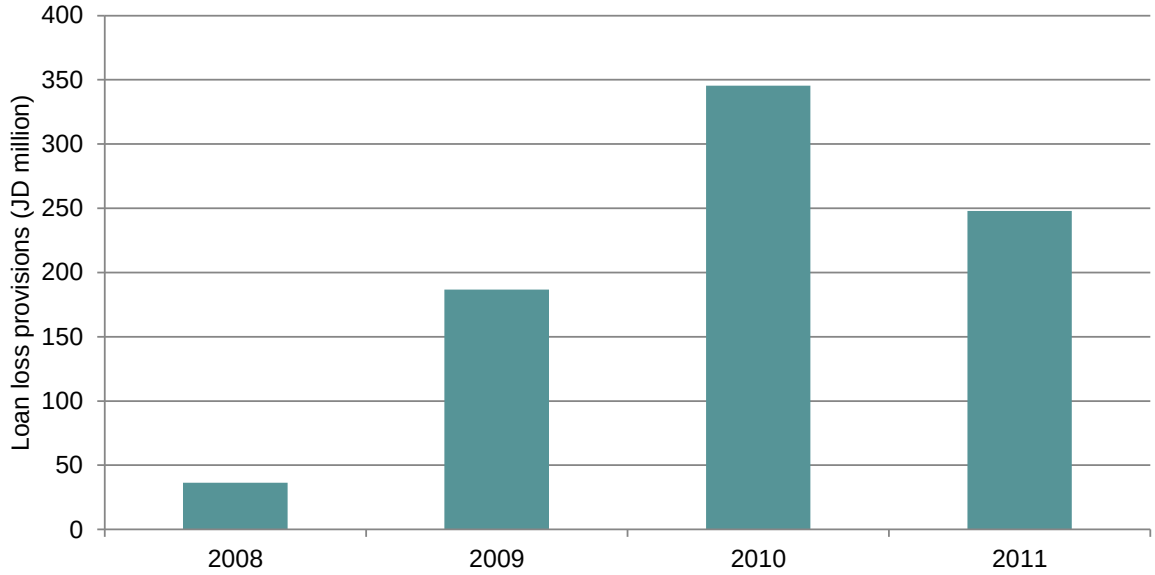
Figure 9: Arab Bank alone holds approximately half the market for direct lending and deposits in Jordan



Source: Vivid Economics based on Jordaninvest

The Central Bank classifies banks as either national banks or branches of foreign banks. Both of these categories are then divided into two categories – commercial banks and Islamic banks. Commercial banks follow the usual business model of commercial banks internationally, whilst Islamic banks are required to adhere to the requirements of Shariah law, which include restrictions on charging interest and the principles that activities are of benefit to society.

Figure 10: Loan loss provisions have risen sharply since the start of the crisis



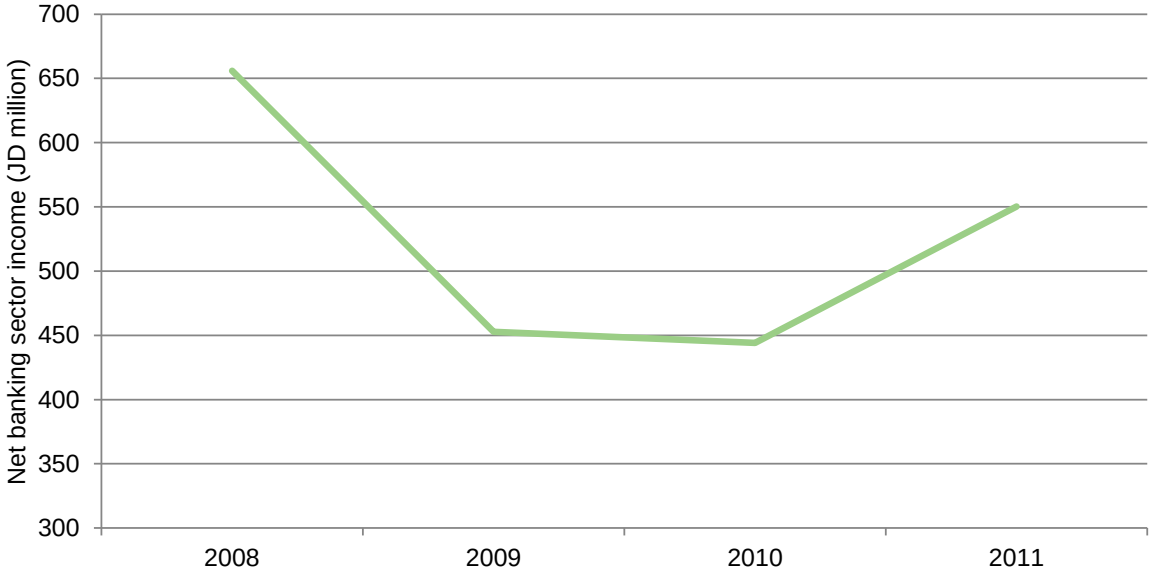
Source: Vivid Economics based on Jordaninvest

The Central Bank of Jordan has encouraged the entry of new banks into the market by the removal of restrictions which had hindered their entry. This has resulted in a number of foreign banks entering the market. In 2004, the National Bank of Kuwait, Banque Audi, and BLOM Bank opened in Jordan. In 2010 the National Bank of Abu Dhabi entered the market and in 2011 the Al-Rajhi Bank began its operations in the Kingdom.

In addition, the Central Bank has made efforts to encourage consolidation. This has included raising the minimum capital requirement for local banks to JD 100 million, against some resistance to this within the sector. There are currently 26 banks operating in Jordan although the market is very concentrated. The three largest banks held approximately 70 per cent of all lending facilities and deposits as shown in Figure 9, which is far above the 10 to 25 per cent levels in Tunisia or Turkey, indicating a relatively high concentration. Consistent with this, Demirguc-Kunt and Peria (2010) conclude that with respect to the Jordanian banking sector '*competition in the country is low and has decreased over time*'.

The international financial crisis of 2008 has raised fresh challenges for the Jordanian banking sector. In response to the global economic slowdown, the Central Bank of Jordan cut its key interest rates on a number of occasions to help boost economic activity. There was some concern over the strength of the local banks and the exposure of Arab Bank, Jordan's largest bank, to major Gulf companies which were in difficulties created some uncertainty about the future of the Jordanian banks (Jordinvest, 2012). As funds were withdrawn from both international and local banks, the Jordanian Government agreed to guarantee all deposits at banks until the end of year 2010. This restored some confidence in the Jordanian banking sector. Nonetheless, bad loan provisions rose rapidly between 2008 and 2010 and remain at a far higher than pre-crisis levels as shown in Figure 10. This resulted in lower net incomes as shown in Figure 11.

Figure 11: Net banking sector income has fallen significantly since the start of the financial crisis



Source: Vivid Economics based on Jordaninvest

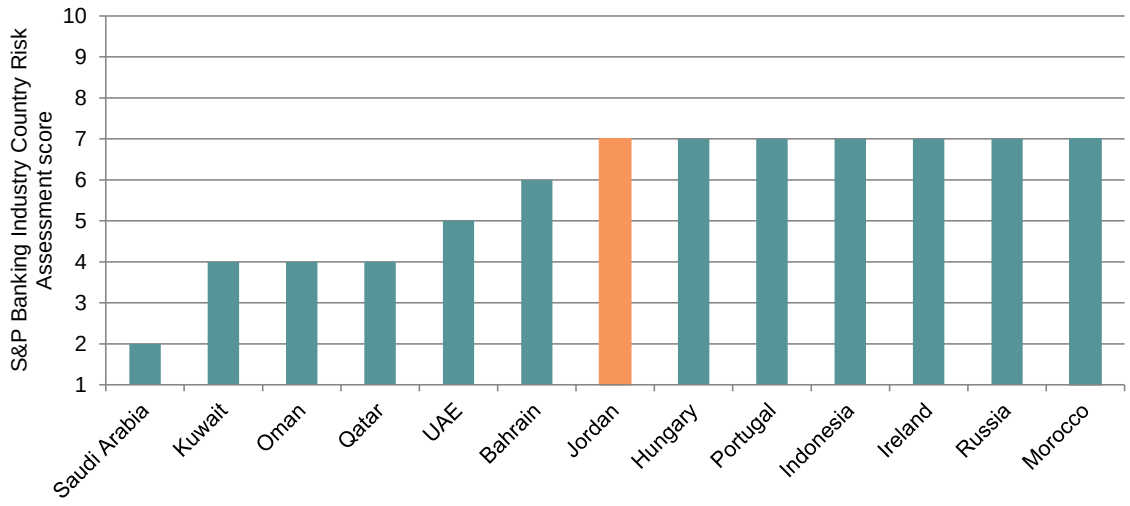
Nonetheless, the relatively strong capital position of the banks meant that they had sufficient cushioning against shocks. This is a consequence of capital adequacy ratios surpassing the required Basel II ratios as well as strong liquidity positions due to Central Bank restrictions on the level of lending. The IMF states that "the Jordanian banking system remains sound and the Central Bank of Jordan continues to exercise prudent regulation and supervision of the banking system, and banks have remained conservative in their funding practices" (IMF, 2012a)

Notwithstanding the relatively prudent regulation of the sector, the future outlook for the Jordanian banking system is challenging. It has been affected by the problems in the Jordanian economy, as discussed in Section 3.1. These future concerns led Standard and Poor's to position the banking sector in group seven out of ten rating groups in its Banking Industry Country Risk Assessment, which evaluates and compares banking systems internationally. This puts Jordan at a moderately high risk together with countries affected by the European debt crisis such as Portugal and Ireland and other developing countries and more risky than its oil producing neighbours, as shown in Figure 12.

The net effect of the result of these historic and future challenges is that banks are increasingly reluctant to lend. Banks generally require high levels of security or collateral to support loans which can often be in excess of the loan value itself. The conventional practice is to take a charge over physical assets to secure loans extended and there appears to be a general unwillingness to assess the strength of future cash flows from business activities and lend against this expected future income. As of December 2011, the

JD loan vs. deposit ratio was near 73 per cent, which is lower than the average of approximately 130 per cent in the Eurozone and 90 per cent in the US and puts the average of Jordan at the lower end as shown in Figure 13 (European Central Bank, 2012). Consistent with this, the World Development Indicator's database shows a significant decline in domestic credit to the private sector lending within Jordan: from 92 per cent of GDP in 2006 and 2007 to 73 to 74 per cent on 2010 and 2011. Small and medium-sized enterprises (SMEs), in particular, report a difficulty in accessing bank loans (World Bank, 2011).

Figure 12: Jordan's banking industry is riskier than its oil producing neighbours and on par with struggling European and other developing countries



Note: *The index ranges from one, the best, to ten, the riskiest.*

Source: *Vivid Economics based on S&P Banking Industry Country Risk Assessment*

A further challenge to private sector lending in Jordan is that the Jordanian government is currently borrowing heavily, largely drawing on the resources of the Jordanian banking sector. This funding is usually via certificates of deposit (CDs) at fairly high interest rates of around 8 per cent per annum. Such loans are sought after by the banks as the government would have the best credit rating of any borrower in Jordan and, as such, the interest rate received is regarded as generous. However, whilst providing essential funding for government activities, it is possible that this borrowing activity is reducing funds available for, and potentially increasing the costs incurred by, the corporate and private sectors.

There have been a number of initiatives aimed at stimulating lending in the Jordanian economy:

- The introduction of a floating charge;
- Various loan guarantee schemes;
- The passing of a Sukuk law.

In 2012, a new banking law introduced the option of permitting a floating charge over a company's overall assets. A floating charge is a security interest over a pool of changing assets of a company[6], which 'floats' or 'hovers' until conversion into a fixed charge, at which point the charge attaches to specific assets. The conversion (called crystallisation) can be triggered by a number of pre-agreed events. A floating charge

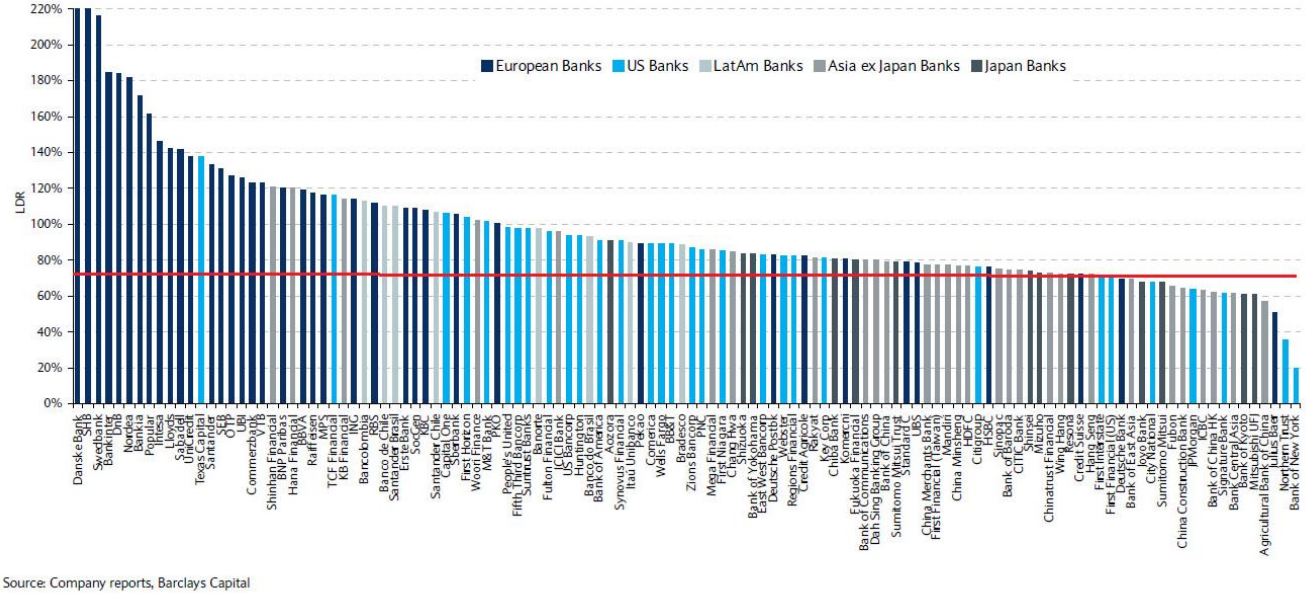
6 Very occasionally the charge is over just a class of the company's assets, such as its stock.

can be very useful for companies, allowing them to borrow even though they have no specific assets, such as freehold premises, which they can use as security. The company can also continue to use assets and can buy and sell them in the ordinary course of business without needing fresh consent from the lender. It is as yet unclear what effect thus will have on lending activity in Jordan.

There are various loan guarantee schemes in operation in Jordan, often focused at promoting SME lending (who do not have the collateral that banks otherwise require to lend). This includes the Jordan Loan Guarantee Corporation (JLGC), a scheme sponsored by the Overseas Private Investment Corporation (OPIC) and a scheme operated by the Government Development Fund. These are discussed further in Section 5 below.

In 2012, the Islamic Sukuk Law was passed by the Jordanian parliament. To date, the activity of Islamic Banks in Jordan is not very mature. They have not been able to identify appropriate lending opportunities, consistent with Sukuk principles, to date and their much of their (large) reserves are currently held on deposit at the Central Bank at zero per cent interest. The passing of the Sukuk Law is intended to provide Islamic banks in Jordan with Sharia-compliant financing mechanisms, thereby enabling the mobilisation of Islamic banks' considerable capital for the benefit of appropriate business and personal lending opportunities. Again, it is not yet clear what effect this law will have on Islamic financing in Jordan.[7]

Figure 13: The average loan-to-deposit ratio in Jordan is low by international standards



Source: Company reports, Barclays Capital

Note: The red line represents the 73 per cent average loan-to-deposit ratio of commercial banks in Jordan

Source: Vivid Economics based on various company reports, Barclays Capital and Jordaninvest

3.3. The current green economy context in Jordan

Reflecting the need for, and opportunities from, a transition to a green economy (as discussed in Section 2) the Government of Jordan is currently supporting a range of policies towards this end. Under Jordan's National Agenda 2006-2015 environmentally sustainable economic development is a key policy goal, and the Ministry of Planning and International Cooperation's Executive Development Programme 2011-2013 recognizes the country's transformation towards the green economy as a priority (MOPIC, 2012). A host of

7 As regards the interaction between two of these recent initiatives, it is not clear at this stage how this floating charge will be viewed under Sukuk protocols given the requirement only to fund specific assets. It is expected that this will be dealt with in the regulations which will underpin the law, which are currently awaited.

policies and programmes exist across several sectors, for example energy, waste, water, transport, agriculture, forestry and air pollution. Some of these are elaborated further below.

The Ministry of Environment is the focal point for issues surrounding the green economy. It has spearheaded efforts in the environment sector, e.g. in areas of hazardous waste, water resource management, air pollution, and vehicle and industrial quality and efficiency standards, working with the private sector and non-governmental organisations (NGOs). Current activities include the rehabilitation of the Zarqa River Basin, the Jordan Cleaner Production Programme and the Eco-Cities of the Mediterranean initiative (see Section 6). As efforts to establish a green economy have become more prominent, the government institutions responsible have also increased in number. The Ministry of Energy and Mineral Resources, the Ministry of Public Works and Housing, the Ministry of Municipal Affairs and the Ministry of Planning and International Cooperation are all also currently involved in green economy promotion.

Below, we focus on the energy and water sector. As outlined in Section 2, the UNEP Scoping Study identifies six key sectors for the Jordanian green economy: these are energy, transport, water, waste, agriculture and tourism. Actions in each of these sectors are necessary and the recommendations in Section 5 relate to all of these sectors. However, there is justification for special attention on the energy (energy efficiency and renewable energy) and water sectors for at least three reasons. Firstly, as shown in Section 2, it is in these sectors that Jordan is facing the most acute challenges notably concerning water scarcity and the need for energy diversification. Secondly, as shown in Figure 5, the financing needs in these sectors (the specific focus of this work) are the greatest, accounting for more than 70 per cent of the overall investment requirement identified by the UNEP Scoping Study. Thirdly, and linked to the second point, the bulk of the activity by the Jordanian government has been focused on these sectors. This is evidenced by the policies and strategies noted above, by government statements to that effect (e.g. by the Minister of Finance in August 2012), as well as by the direction given in our Terms of Reference.

3.3.1. Energy sector

Jordan's Master Strategy of the Energy Sector for 2007-2020 recognises the green economy opportunities in the sector. It sets a target to develop 1,800 MW (1,200 MW of wind power, 600 MW of solar power and up to 50 MW of waste energy) from renewable sources by 2020, so that renewable energy may account for 10 per cent of total energy supply. An interim target of 7 per cent of energy supply has been set for 2015. This compares with current estimates from the Electricity Regulatory Commission (ERC) that renewable energy installed capacity amounts to 108 MW and is responsible for around 3.5 per cent of the total electricity generated in Jordan (ERC, 2010). The Master Strategy also calls for energy savings of 20 per cent, the provision of solar water heating systems to 30 per cent of households, and for the exploitation of oil shale reserves and for oil and gas exploration – all by 2020.[8]

To help deliver this, the Renewable Energy and Energy Efficiency Law no. 13 (RE & EE Law) was adopted in 2012. The law creates a regulatory and financial framework for renewable energy production and incentives to encourage energy efficiency and establishes the Renewable Energy and Energy Efficiency Fund. Separate regulations to implement the law were also passed in 2012.

Further to the Law, there are three main routes through which renewable energy production will proceed in Jordan. Three main routes through which this will be delivered:

- *Through a tendering process*. This is the typical approach adopted in Jordan for procuring new generation capacity. Under Article 5 of the Law, the government identifies a site, technology type and capacity and invites bidders to submit a tender for the tariff it would require to invest. The most economically advantageous bidder is successful. At the time of writing, there was one tender for a wind project for 70 to 90 MW under consideration.
- *Direct proposals.* This is a more innovative approach to procuring new power generation in Jordan by which, under Article 6 of the Law, parties are invited to identify their own sites for generating

8 By BP.

renewable electricity. The proposals must include details on the design, financing and use of local inputs related to each project. Applicants must demonstrate at least five years' experience in the renewable energy field, with a record of project implementation. The regulations underpinning the Law identify a series of reference prices (listed below)[9], with the Government of Jordan then determining which it wishes to procure. This modality has generated considerable interest with 64 proposals submitted. Of these, 34 proposals were shortlisted and most of these are expected to prepare a full proposal. Parties have six months (for solar photovoltaic (PV)) and 18-24 months (for concentrated solar power (CSP) and wind respectively) to prepare these proposals. The Government of Jordan expects that from these bidders around 850 MW of capacity will be constructed, split roughly 50:50 between wind and solar (both CSP and PV).

- *Distributed generation and net metering*: Under Article 10 of the law, for small-scale (less than 5 MW) renewable generation connected to the distribution (rather than transmission) network, and where some of the renewable electricity generated on site is consumed by the producer, net metering arrangements are in place that allow the excess power to be sold to the grid. There is a feed-in tariff of 120 Fils per kWh for solar energy, 95 Fils per kWh for hybrid energy and 85 Fils per kWh for other forms of renewable energy.[10] A further premium of 15 per cent applies to the tariffs if the renewable energy system is of Jordanian origin, although there is scope to withdraw this provision if total installed capacity of Renewable Energy Systems exceeds 500 MW. Furthermore, there is cap on the renewable energy capacity connected to each distribution network of 1.5 per cent of the electrical load recorded on the network.

The reference prices for direct proposals are lower than the current estimated generating costs of fossil fuel power. The list of prices stipulated in the regulations is shown in Table 2. A further premium of 15 per cent is applicable to these figures if the facility is deemed to be of fully Jordanian origin.

Table 2: Reference prices under Article 6 of the Renewable Energy and Energy Efficiency Law

Technology type	Fils per kWh	$ per kWh
Wind	85	0.12
CSP	135	0.19
Solar PV	120	0.17
Biomass	90	0.13
Biogas	60	0.08

Source: Electricity Regulatory Commission

By comparison, the IMF reports that, given the gas supply disruptions from Egypt (discussed in Section 2), forcing reliance on diesel and heavy fuel oil, fossil fuel power sources at present have an average cost of generation of 197 Fils or $0.28 per kWh.

All renewable power is bought by the National Electric Power Company (NEPCO). Under the regulations, NEPCO, which is the sole-buyer in the Jordanian power sector, is mandated to purchase all renewable power generated, with the exception of distributed generation.

9 Subject to a cap of 100 MW for wind, 50 MW for CSP and 20 for solar PV.

10 The use of two or more renewable energy sources within a single application.

There are also on-going discussions with the Gulf Cooperation Council (GCC) to provide resources to support renewable energy projects. It is likely that $300 million of resources will be provided, which the Government of Jordan anticipates will be used to finance between 100 and 150 MW of wind and 50 and 75 MW of PV capacity, or perhaps more if supplemented by private capital in a PPP arrangement. The Government of Jordan may wish to consider discussing with the GCC whether some of these funds may be diverted into the Jordan Renewable Energy and Energy Efficiency Fund (JREEEF) (see below), although it has not been possible to assess the receptiveness of the GCC to this idea as part of this work.

There are a number of tax incentives to support renewable energy and energy efficiency. In particular, under Article 11 of the Law "all systems and equipment of renewable energy sources and energy efficiency and its production inputs whether manufactured locally and/or imported, will be exempted from all customs duties and sales tax". Further, any investment in renewable energies may be completely exempted from income tax within its first decade of operation.

There are a number of energy efficiency initiatives proceeding in pursuit of the 20 per cent energy consumption reduction target by 2020.

- A tender has been launched to replace all incandescent bulbs in government buildings with compact fluorescent lamps (CFLs). Seven bidders responded to the tender and at the time of writing, a final decision was expected imminently.
- There is a plan to undertake a similar initiative in households, and a feasibility study has been undertaken.
- There is a new requirement that all new buildings with more than 250 square metres install a solar water heating system.
- All installations that consume more than 50 tonnes of oil equivalent per annum must undertake an energy audit and subsequent regular monitoring.
- There is an ongoing media plan to raise awareness of the opportunities from energy efficiency.

In addition, there is ongoing work to finalise the National Energy Efficiency Action Plan which is expected to be completed in 2013.

To support both renewable energy and energy efficiency investments, the RE & EE Law provides the framework for the creation of the Jordanian Renewable Energy and Energy Efficiency Fund. This is intended to provide public financial support to encourage investment in these opportunities. The Fund has taken a long time to develop and remains at an embryonic stage. The long-term vision for the Fund envisages support provided by five windows:

- A renewable energy subsidy window to support the deployment of renewable power by closing the gap between production costs and PPA prices.
- A window to promote studies and technical cooperation, for example feasibility studies, training, demand side management and programme development.
- A renewable energy and energy efficiency guarantee facility to promote bank lending to renewable energy and energy efficiency projects.
- A renewable energy and energy efficiency interest rate subsidy window which would reduce the overall costs to developers of these projects.
- An equity window to offer public-equity to managed investment funds.

However, there are currently only three activities planned in the short-term:

- Public sector subsidy scheme which may be used to support switching to CFLs in public sector buildings.
- Towards local communities that contribute to the rationalization of energy consumption, a public sector subsidy window to encourage the use of solar water heaters.

» A technical consulting window so that the Fund can develop approval process and increase awareness about opportunities.

To date the fund has limited resources, and is mainly capitalised by domestic funds. The Fund currently has JD 20 million which comes from a levy on electricity bills previously used to support rural electrification that is no longer needed for this purpose. The Fund is also entitled to receive 10 per cent of the revenues from Certified Emission Reduction (CER) certificate sales from renewable energy and energy efficiency carbon market projects in Jordan. There have also been commitments of €1.56 million from the AFD and JD 1 million from Global Environment Facility (GEF), and implemented by the World Bank, to help with fund establishment.

A key feature of the fund is that it has close links to government. The Ministry of Energy retains the ultimate right of approval consent over most operational aspects of the Fund's activities, including, crucially, funding decisions. The management committee of the Fund is chaired by the Minister of Energy and Mineral Resources, and also comprises the Secretary General of the Ministry of Environment, the Ministers of Planning and International Cooperation and Finance, and three representatives of the private sector – i.e. it has majority government representation.

There are extensive fossil fuel subsidies in the energy sector that impede energy efficiency and renewable energy project development. Although conventional power generation costs are currently 197 Fils per kWh, NEPCO sells power to distribution utilities at around a third of this rate. As well as damaging the incentives for energy efficiency and renewable power production, this is a major driver of the macroeconomic instability reported above (IMF, 2012a). In addition, there are subsidies on other fossil fuel energy use, for example on petrol, diesel, kerosene and cooking gas. In total, in 2010, the government was subsidising subsidised products by an average of 29.35 per cent (World Bank, 2012). In November 2012 the government took the decision to remove subsidies on these fossil fuel products (though not on electricity), which will lead to price rises of between 15 per cent and 55 per cent (see Section 4.3 for further details).

There are also a range of existing development initiatives to support renewable energy and energy efficiency development in Jordan. The two primary actors are the AFD followed by USAID. The former, in addition to supporting JREEEF, is implementing a €53 million energy efficiency and renewable energy credit line, is supporting the implementation of the Jordanian government's energy efficiency plans, and providing €150 million in budget support in the energy sector. The latter is supporting regulatory and institutional improvements in the Electricity Regulatory Commission and the National Electric Power Company. Further details can be found in Tables 3, 4 and 5 below.

3.3.2. Water sector

The water sector in Jordan is dominated by three corporatized, publicly-owned, vertically integrated[11] utilities responsible for water supply to households. These are the Yarmouk, Mihayouna and Aqaba Water Companies, together accounting for 70 per cent of supply in volume terms. Each is responsible to the Water Authority of Jordan (WAJ) which, in turn, is under the jurisdiction of the Ministry of Water and Irrigation (MWI). WAJ is also directly responsible for water supply in geographical regions not covered by the three main water companies and accounts for the remaining 30 per cent of supply (again in volume terms). There is an intention to introduce greater vertical separation in the water sector with WAJ taking responsibility for water production (bulk water supply) and the three companies assuming responsibility for just distribution.

Jordan has produced a Water for Life – National Water Strategy 2008-2022 aimed at overcoming the acute challenges it faces in the sector. As discussed in Section 2, Jordan is one of the most water scarce countries in the world but, despite this, its current use of water resources remains inefficient. Agriculture accounts for roughly 56 per cent of water use in the country, with municipal and industrial consumption accounting for 40 per cent and 4 per cent respectively. 15 per cent of total energy use is also in the water sector (USAID, 2012). Over the past two decades government and private investment in water supply has been in groundwater abstraction, large and small scale desalination. The Water Strategy aims to cut

11 Utilities that utilities are responsible for everything from bulk water supply to distribution.

back on abstraction – from 32 per cent of supply in 2008 to 13 per cent by 2022 – and to increase the use of alternative water sources such as desalination plants, wastewater treatment and other large bulk water supply projects.. It also aims to substantially improve the efficiency of use of Jordan's limited water resources.

To deliver on these plans and meet increasing demand, substantial investment will be required. The UNEP Scoping Study identifies investment needs in the water sector of JD 330 million (not including certain large scale infrastructure investments). The Ministry of Water and Irrigation and international organisations agree that the cost per m^3 of water supply will rise from JD 0.35 to JD 0.95 to 1.10 or more (USAID, 2012). MWI has a list of approximately 150 bulk water supply, waste water treatment and distribution projects. Broadly speaking, the funding available is intended to rehabilitate water distribution and sewerage networks, upgrade water treatment plants, replace and modernise meters and facilitate operations and maintenance. To help fund this investment, the government has allocated 16.5 per cent of the Executive Development Programme[12] (EDP) funds for the water and wastewater sector, more than any other sector (Ministry of Planning and International Cooperation, 2011). Nonetheless, greater levels of investment will be needed to sustainably meet Jordan's water needs over the long term.

A number of large and high profile projects are planned or already underway, which are indicative of these ambitions:

- *Disi Pipeline.* The Disi Pipeline is a project financed jointly by the public and private sector intended to supply 100 million cubic metres of fresh water per year to Amman from the Disi aquifer, 300 km from Amman in southern Jordan. The projected cost of $1.1 billion is financed by an equity contribution of around $200m from the project sponsor (GAMA Energy, a joint venture between GAMA Holdings and General Electric), a $300m grant from the Ministry of Water and Irrigation and lending from various development partners (including OPIC, EIB and PROPARCO).
- *Red-Dead Sea Conveyor.* The Red Sea to Dead Sea project aims to create a connection between the two water sources to supply the entire surrounding region, which includes Israel and the Palestinian Authority as well as Jordan, and to stabilise the Dead Sea's water levels. Fresh water will be obtained via desalination and would provide 850 million cubic metres. The main obstacle is the net electricity demand that results from pumping seawater 230 metres up from the Red Sea in order to flow downwards to the Dead Sea, as well as from the desalination process. The full project costs are expected to exceed $10 billion (World Bank 2012c).
- *As-Samra expansion project.* In 2012 the financing was agreed for a $223 million expansion of the As-Samra Wastewater Treatment Plan. This will increase the amount of treated water released into the Zarqa River providing an additional source of irrigation and also improving the environmental integrity of the river. This project was financed a Public-Private Partnership with private debt and equity sources providing $110 million, the Government of Jordan $20 million and the Millennium Challenge Corporation $93 million (as grant finance).

Much of the substantial investment required is expected to be financed by the public sector, though there are some private sector contracts in the water sector. The current intention is that the majority of the projects in the EDC will be financed through direct budgetary contributions, potentially supported by development partners.[13] Most private sector investment is restricted to green-field projects in treatment plants and water transfer systems. At the distribution level, Veolia, based in France, is currently operating the Yarmouk Water Company under a five year management contract[14], with Miyahouna also having been run under an external management contract in the past. Private sector contractors have also been brought

12 The EDP is the government's action and funding plan for the country's development.

13 Only three of the activities and projects listed in the EDP have been identified for private funding (OECD, forthcoming).

14 The management contract consists of both a fixed payment and a variable payment based on performance against four criteria: energy efficiency improvements, operating cash surplus, water sales (decreases in non revenue water) and continuity of supply. Payment is partially through the Government of Jordan and partly from KfW.

in to assist with billing in some parts of the country. The intention is that these contracts will allow for transfer of best practice water company management into the Jordanian water sector. However, the problem of non-revenue water and low-tariffs means that these contracts may not be very commercially attractive for private sector participants. The full privatisation of water distribution in Jordan is a long-term goal.

Financing this investment is impeded by tariffs that are below cost-recovery levels. Tariffs are structured on a rising block basis with lower tariffs for smaller amounts of annual consumption. Lower consumption blocks are particularly heavily subsidised which, despite being partially justified on social grounds, has been shown to disproportionately benefit richer, smaller households (USAID, 2012). Data provided by the Ministry of Water suggests that, on average, in 2008, tariffs covered around 60 per cent of full costs (but fully covered operating and maintenance costs) while the IMF reports that water subsidies account for around 0.4 per cent of GDP (IMF, 2010). Representatives from the water companies that we spoke to broadly concurred with this in terms of the current costs of network operation, but argued that tariffs are perhaps only 25 per cent of the level that would be required to cover substantial and necessary network enhancement.[15] Costs will further increase when the Disi project comes online in 2013. Despite this, MWI stated in June 2012 that water tariffs would not increase in the near future, nor would subsidies be compromised (OECD, 2012). This illustrates the significant political sensitivity concerning water pricing. In addition, groundwater abstraction for agricultural irrigation is particularly heavily subsidised (USAID, 2012).

There is a substantial problem with non-revenue water (regarding either leakage or administration) which creates further challenges in financing water investment as well as having impacts on national water reserves. At a national level, it is estimated that 43 per cent of water is either lost as leakage or not paid for. In some parts of the country, we understand that the proportion is sometimes above 50 per cent. The administrative non-revenue water is the result of authorized non-metered use (such as fire-fighting), meter inaccuracies and illegal connections (especially in relation to agriculture use) while leakage reflects underlying asset maintenance problems. These problems mean that water supply is only periodic; for instance, under the Miyahouna Water Company, the number of hours of water supply per week available to each area has diminished over the last five years from 66 in 2005 to 36 in 2010 (USAID, 2012). The Water Strategy referred to above aims to reduce non-revenue water by 25 per cent by 2022. Pilot studies undertaken by USAID suggest that reducing leakage rates may be a more cost effective approach to increasing water supplies than finding new sources of water (USAID, 2012).

Municipalities, agriculture and industry primarily acquire their water directly from groundwater supplies (USAID, 2012). The water companies discussed above are primarily responsible for household (including hotels and schools) water supply. Agriculture and industry typically source their water directly from groundwater supplies[16], and/or through publicly funded irrigation schemes. In agriculture the abstraction prices paid are reported to be typically around half the price offered by water companies, though in industry prices are more cost reflective. Agricultural water use is particularly prominent: it accounts for more than seventy per cent of total water use despite only accounting for around 4 per cent of Jordan's GDP.

There are but it is unclear how successful they have been. Efforts, notably via the corporatisation of the utilities, to increase efficiency, reduce costs and enhance revenues have taken place. The Council of Ministers also introduced a Water Demand Management Policy in 2008. To implement this, the Ministry of Water and Irrigation has developed the 'Instituting Water Demand Management' (IDARA) programme since 2009. But as identified in Section 2, there are still major water productivity issues that remain to be addressed.

There is an important overlap between the water sector and energy efficiency: the water sector accounts for 15 per cent of total energy use in the country. Industry representatives report that there are many energy efficiency opportunities in the water sector, for example pump replacements, with pay-back periods of just two to three years (under conditions when water use is priced at cost).

15 According to experts in October 2012.

16 For instance, the Agricultural Credit Corporation provides farmers with soft loans to drill tube wells, install diesel pumps, reclaim and level the land and put it under sprinkler or localised irrigation (FAO, 2011).

Development agencies are active in the water sector in Jordan.. The AFD is involved in development built water supply infrastructure in the Disi Pipeline and the Red Sea-Dead Sea Conveyer, amongst others, as well as in research and regulatory matters. USAID is implementing a variety of activities including in water and wastewater treatment infrastructure, institutional and regulatory reform, water conservation, operations and maintenance in distribution companies and awareness-raising. In addition to USAID, the Millennium Challenge Corporation (a further US government agency) has signed a $275 million compact to provide grant finance to support water infrastructure (part of which supported the As-Samra expansion discussed above). Tables 3 to 5 below provide an indication of the activity of a range of different development partners. It is not intended as a comprehensive list.

Table 3: AFD projects span the energy and water sector as regards the green economy in Jordan

Project	Partners	Duration	Amount
Water			
Disi Water Conveyance System Project	Water Authority of Jordan & Diwaco	2009-2013	$200 million (loan from AFD & Proparco)
Groundwater-flow modelling	Ministry of Water and Irrigation	2012-2015	€315,000 grant
Highland Water Forum	Ministry of Water and Irrigation	2012-2015	€345,000 grant
Red Sea-Dead Sea Water Conveyance Study Program	World Bank, Ministry of Water and Irrigation & Jordan Valley Authority	2006-2012	€3 million (grants from AFD & FFEM)
Water Transmission Pipeline	Ministry of Water and Irrigation & Water Authority of Jordan	2012-	To be determined
Energy			
Energy Efficiency & Renewable Energy Credit Line	Capital Bank & Cairo Amman Bank	2011-2024	$53 million (credit line) & €300,000 (technical assistance grant)
Energy Efficiency in Lighting	National Energy Research Council, Ministry of Energy and Mineral Resources & Ministry of Planning and International Cooperation	2009-2012	€422,000 (grant)
Support to JREEEF	Ministry of Energy and Mineral Resources	2008-2012	€1.56 million grant from FFEM)
Support to the implementation of the Energy Efficiency Roadmap	Ministry of Energy and Mineral Resources	2011-2013	€500,000 (grant)
Energy Sector Policy Loan (Budget Support)	Ministry of Planning and International Cooperation, Ministry of Finance & Ministry of Energy and Mineral Resources	2012-2013	€150 million (loan)
Transportation			
Bus Rapid Transit	Greater Amman Municipality	2010-	$166 million
Environment			
Air Quality Monitoring System	Ministry of Environment	2008-2013	€1.5 million (grant)
Biodiversity			
Royal Botanical Garden	Royal Botanical Garden	2010-2016	€1 million (grant from FFEM)
SME support			
SME Support Program Grant	Jordan Enterprise Development Corporation	2012-2017	€940,000 (grant)
Agriculture and rural development			
Irrigation Optimisation in the Jordan Valley	Jordan Valley Authority	2007-2012	€2.7 million (grant)

Source: AFD Jordan

Table 4: USAID projects in the green economy in Jordan are predominantly in the water sector

Project	Partners	Duration	Amount
Water			
Upgrading Mafraq Wastewater Treatment Plant	Water Authority of Jordan, Engicon & NA Water Systems LLC	2007-2014	$24.9 million ($21.4 million grant & $3.5 million from Water Authority of Jordan)
Enhancing Water Awareness	Peace Corps	2011-2013	$242,000 (grant)
Water & Wastewater Infrastructure	Ministry of Water and Irrigation, Water Authority of Jordan, Aqaba Water Company & Miyahouna Water Company	2010-2015	$34.1 million (grant)
Institutional Support and Strengthening	Ministry of Water and Irrigation, Water Authority of Jordan, Aqaba Water Company, Yarmouk Water Company & Miyahuna Water Company	2010-2013	$11.3 million (grant)
Water Reuse and Environmental Conservation	Ministry of Water and Irrigation, Ministry of Environment, Ministry of Industry and Trade & Jordan Chamber of Industry	2010-2015	$28 million (grant)
Public Action for Water, Energy, and Environment	Ministry of Water and Irrigation, Ministry of Environment & Ministry of Energy and Mineral Resources	2004-2014	$24 million (grant)
Operation & Maintenance Programme	Yarmouk Water Company	2008-2012	N/A
Operation & Maintenance Programme	Al Balqu Applied University	2008-2012	N/A
Sewer Cleaning Bucket Machine Procurement	Water Authority of Jordan	2012-	N/A
Energy			
Electricity Utility Transmission and Distribution Partnership	National Electric Power Company	2009-2012	$1.4 million (grant)
Electricity Regulatory Commissions Partnership	Electricity Regulatory Commission	2009-2012	$660,000 (grant)

Source: USAID Jordan

Table 5: Other development agency projects in the green economy in Jordan are predominantly in the energy sector

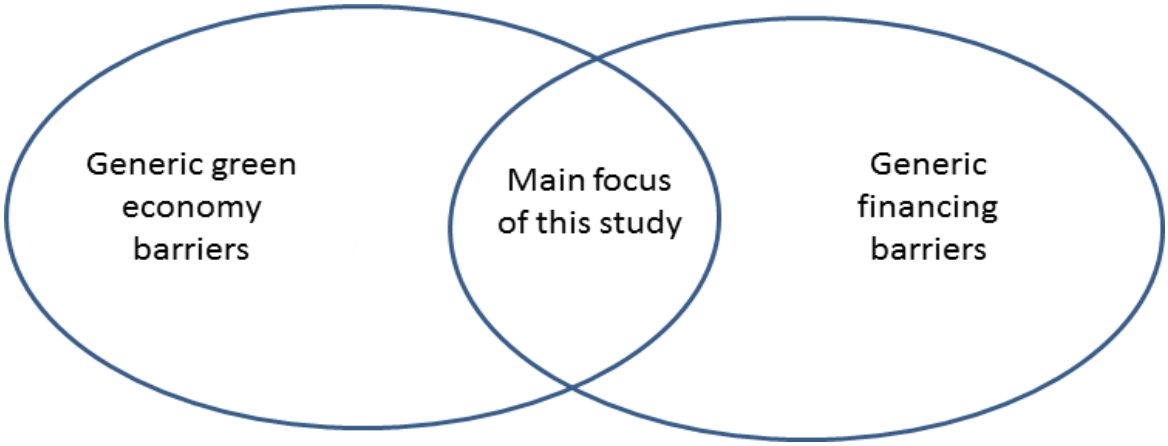
Development agency	Project	Duration	Amount
World Bank / Global Environment Facility	Promotion of Wind Power Market in Jordan	2008-2013	$6 million (grant)
World Bank / Global Environment Facility	Energy Efficiency Investment Support Framework	2009-2013	$1 million (grant)
World Bank/ International Finance Corporation	Clean Technology Fund Support for Jordan CSP Program	N/A	$72 million (concessional loan)
European Union	Renewable Energy & Energy Efficiency Program in Jordan	2011-2014	€35 million (grant)
UN Environment Programme	Global Market Transformation for Efficient Lighting in Jordan	2012-2013	$50,000 (grant)
Government of Spain	1 MW Solar PV Power Plant in Azraq	2010-2013	$5.2 million (debt swap)

Source: JREEEF

4. Barriers to the growth of the green economy in Jordan

Barriers preventing the growth of the green economy in Jordan may be usefully segregated into three, relatively distinct groups. These are generic financing barriers; generic factors which restrict the development of the green economy; and then, overlapping with both of them, specific factors relating to the actual financing of green investment. This idea is captured in Figure 14.

Figure 14: Barriers to the green economy can be grouped into three categories



Source: Adam Smith International and Vivid Economics

It will be necessary to address all three sets of barriers, and not simply those that relate to green financing by Jordan's banking sector, in order to effectively scale up green investment.

This section presents our assessment of the key barriers in Jordan. It adopts the following structure:

- general investment and access to finance barriers are covered in Section 4.1;
- Section 4.2 identifies specific financing barriers associated with green economy projects – many of these green financing barriers result from a lack of familiarity and understanding of green economy projects (i.e. a lack of 'deal flow');
- Section 4.3 goes onto discuss some of the broader policy and other barriers holding back the development of projects consistent with the green economy.

4.1. Generic finance barriers in Jordan

There are a number of general investment and access to finance barriers that apply to the whole Jordanian economy rather than just to particular green sectors. As such, they inhibit the effective and efficient lending of capital by Jordanian banks to the private sector in its entirety, and would need to be overcome in order to increase lending to those businesses focused on the green economy. These might be grouped into three categories:

- A shortage of lending capacity in the Jordanian banking system;
- Patterns of lending activity that restrict access to credit for many parts of the economy;
- Other factors.

4.1.1. Reduced private sector lending capacity

First, there is reported to be an increasing squeeze on the lending capacity in the Jordanian banking system, largely as a result of the government's financing requirements. Based on correspondence from the Central Bank, there is estimated to be around JD 2 billion of spare lending capacity in the Jordanian banking system (assuming no additional capital-raising by banks). This is down by 50 per cent from the figure two years ago and is equivalent to only around 10 per cent of Jordan's GDP. Moreover, this lending capacity is concentrated in a small number of banks. Consistent with this, and as reported above, private

sector lending as a percentage of GDP – currently 73.5 per cent – is also falling, though it is still substantially higher than in most MENA countries while the IMF has also expressed concerns about the private sector being crowded out of credit markets (IMF, 2012b). These problems are particularly acute in certain sectors: industry, construction, retail and trade account for 60 per cent of domestic credit, and beyond these sectors it is harder to access credit. Access to finance in the agriculture sector beyond dedicated schemes such as the Agricultural Credit Corporation (ACC) is reportedly low

Consistent with this scarcity of debt capital, interest rates on loans are relatively high. Yields on Jordanian government debt are reported to be 8.3 per cent creating an effective interest rate floor.[17]

These problems have been exacerbated by the absence, until very recently, of a Sukuk Law. Islamic banks have suffered major restrictions on lending due to the absence of Sharia-compliant funding mechanisms in Jordan, which has resulted in large deposits with the Central Bank of Jordan at zero per cent interest. This has been addressed by the recent approval by the Jordanian Parliament of the 2012 Islamic Sukuk Law, which is intended to provide the Islamic banks in Jordan with such Sharia compliant mechanisms. Whilst it is too early to judge, it is expected that this will allow the Islamic banks in Jordan to become more active generally as well as in the green economy.

4.1.2. Patterns of lending that restrict access to credit

The lending terms available to the private sector are not always compatible with the expectations and requirements of borrowers. For instance, some key issues are:

- *Insufficiently long tenors*. Loan tenors are rarely more than five to seven years. Islamic banks are not permitted to lend for more than five years. Commercial banks could do so under the right conditions, but rarely do. Five to seven years is shorter than businesses across the economy often require, especially for more capital intensive projects.
- *Preference for larger firms and reluctance to lend to SMEs*. 50 large Jordanian firms account for 98 per cent of domestic lending, with very little credit going to SMEs.[18] This is despite the fact that 98.6 per cent of the 17,000 industrial firms in Jordan are classified as SMEs (firms with 99 employees or under seeking finance of between circa JD 50,000 and JD 500,000). Banks are reluctant to lend to SMEs for a variety of reasons, including the poor quality of business plans, the reliability of accounts and insufficient auditing and the general difficulty in evaluating the quality of loan applications. The situation has improved in the recent past. For example, with the establishment by Arab Bank, and others, of dedicated SME lending departments. Smaller banks are also reported to be more adept at SME lending than larger banks.
- *Reliance on collateralised lending*: Consistent with the point above, banks tend to require collateral 100 per cent to 120 per cent of the value of loans and preferably in the form of real estate, which the majority of investors cannot provide, SMEs especially.

These patterns of lending by banks are often rational. Given the costs and challenges of identifying 'high' quality loan applications from 'low' quality loan applications, it will often be easier to adopt quick and easy approaches to minimising the probability of default, such as those outlined above.

4.1.3. Other factors

Jordan applies a withholding tax of 7 per cent whenever a Jordanian resident provides taxable income to a non-resident. This tax covers interest income paid by a Jordanian borrower to an overseas lender: in this case 7 per cent of the interest payments must be withheld and paid to the tax authority in Jordan. Overseas lenders likely increase their interest rates to Jordanian borrowers to account for this tax, making it more expensive to borrow money from overseas. This may act as a disincentive on overseas borrowing.

17 This is according to discussions with banking sector participants in Jordan in October 2012.

18 This is according to discussions with the Amman Chamber of Industry in September 2012.

There is an apparent lack of alternative sources of capital. In principle, a shortage of bank lending could be offset by other sources of capital such as public or private equity. However, businesses (especially SMEs) in Jordan assert that beyond Jordanian banks there are few other suppliers of capital available to businesses. Equity investors, they say, are scarce and international financial institutions such as the International Finance Corporation (IFC), AFD and EBRD cannot adequately service demand, and in any case they tend – in practice if not intentionally – to lend to medium-sized and larger firms rather than to SMEs, and international banks tend not to lend without an equity investor, which again is hard to come by.

For some international lenders, there may be a latent currency risk. Some businesses, notably those that are larger and earn revenue in foreign exchange, have the option of borrowing internationally, generally in US Dollars. The currency peg between the Dollar and the Jordanian Dinar should negate the risk of exchange rate fluctuation, though investors are conscious of a latent risk of devaluation, particularly given Jordan's current macroeconomic problems.

4.2. Green economy financing barriers

The generic financing barriers identified above are often exacerbated by some of the specific characteristics of green economy projects. These inhibit banks from effectively and efficiently investing in green businesses and projects, and inhibit business from accessing finance of the appropriate sort. In order to increase green investment in Jordan these barriers will need be overcome. Some of the most important of these are:

- *Inability to prepare good quality business plans.* A majority of green businesses and project developers are seen by Jordan's banks as lacking the skills necessary to submit a sufficiently good business plan or loan application to warrant investment. Almost 70 per cent of respondents to a survey of Jordanian banks conducted in October 2012 cite this as the main barrier to green financing. This is in part due to the relative novelty of the sector, meaning that specific skills relevant to presenting green investments to banks may be inadequately developed, and the fact that most green businesses are SMEs and lack, for example, the requisite financial and auditing skills generic to the SME sector.
- *Lack of familiarity with technologies and practices within banks*. Jordanian banks tend not to be familiar with the technologies and practices necessary for the development of a green project, nor are they familiar with green market trends and dynamics. As a result of this lack of information they less able to carry out due diligence and assess the level of risk than would be desired, and exhibit a high level of uncertainty when it comes to appraising loans applications in green sectors. Technologies and practices differ according to whether the project is in renewable energy, energy efficiency, water efficiency, waste management, or another sector, requiring sector-specific expertise within banks. Furthermore, many green economy projects, particularly energy efficiency projects, are not easily aligned with traditional organisational divisions within banks. Over 60 per cent of survey respondents in the banking sectors listed poor information as the primary impediment to green finance.
- *Disconnect between green economy project requirements and bank lending rules*. Many green economy projects require financing terms that are inconsistent with bank lending practices. This means that even if the loan application was credible and of high quality and banks found it easy to appraise, it would not meet their lending rules e.g. on loan tenor, amount of collateral and so on. For instance in the survey referred to above, almost 40 per cent of respondents noted that the mismatch between the tenor expectation of the green economy borrower and that which the bank was willing to provide, was a barrier to lending to green economy projects. This is likely to be a more significant problem for some aspects of green economy lending which are particularly capital intensive, such as larger on-grid renewable power generation plants, and less significant for other, less capital-intensive projects, with shorter pay-back periods (such as some energy efficiency projects).

4.3. Generic barriers to the green economy

From the above analysis, a clear problem preventing the scale-up of green economy financing in Jordan is the lack of experience and knowledge of green economy projects. This means that neither businesses nor banks are fully able to appreciate the opportunities provided by these types of projects. This therefore raises the question as how a greater number of projects might come through the pipeline and seek finance.

Increasing this level of 'deal-flow' could be of singular importance in increasing the financing of green economy projects in Jordan.

A key feature of the green economy is that is very sensitive to the policy environment. Many aspects of the green economy are only profitable as a direct result of policy intervention. International experience shows that investors feel more confident making long-lived green investments when there are clearly articulated policy goals in terms of, for example, greenhouse gas emission reductions and associated timelines, covering a range of sectors in the economy, or the removal of distorting subsidies on fossil fuel energy and water. Investors likewise respond positively to well-designed, transparent, powerful and long-term incentives and regulations.

In this context, some of the key generic barriers to the green economy are laid out.

- *Evolving government priorities.* The long-term ambitions of the Jordanian government as regards the creation of a green economy are perceived to be insufficiently strong and clear and to shift according to changes of or within government. For example, the persistence of subsidies on fossil fuels is taken as a sign that the government is inadequately committed to moving onto a green growth path; the greater level of public support given to nuclear energy than to renewable energy gives the same message. All of this creates uncertainty amongst investors and businesses as to the long-term goals of the government and the viability of their investment. (This links to the 'inconsistent government priorities' and 'policy uncertainty and regulatory risk' issues below.)
- *Inconsistent government priorities.* In addition, the ambitions and priorities of the government are not seen by investors and businesses to be internally consistent. For example, senior levels of government are perceived to be more supportive of nuclear energy than renewable energy, and recent government hesitation over the removal or maintenance of fossil fuel subsidies creates further uncertainty over the extent to which the government is committed to the green economy. On a broader level, the fact that Jordan has had five Prime Ministers in the course of 2011 and 2012 gives the impression of changing politics and policy priorities. To create investor confidence, a range of tax, trade, business, energy and environmental policies and laws – as well as any associated financial support – need to be mutually enforcing and openly supportive of the green economy on a long-term basis.
- *Policy uncertainty and regulatory risk*. Policy and regulatory frameworks are in place for a number of green sectors, e.g. the Renewable Energy and Energy Efficiency Law for renewable energy and energy efficiency and the IDARA programme for water efficiency. But there have sometimes been significant delays to the implementation of these frameworks; for example, the Renewable Energy and Energy Efficiency Fund has only recently had its Chief Executive appointed, despite the relevant legislation being adopted two years ago. The enforcement of environmental legislation has in the past been intermittent, e.g. in the case of toxic waste disposal, raising similar concerns about current green policies and regulations.
- *Uncertain institutional framework*. The Ministry of Environment, Ministry of Energy and Mineral Resources, Ministry of Planning, Ministry of Public Works and Housing, and Ministry of Municipal Affairs are all involved in the drive to create a green economy. But it is unclear which area is responsible for leading and coordinating the development this drive, and these ministries, as well as others, are seen at times to have overlapping mandates.
- *Lack of transparent public-private engagement, dialogue and understanding.* Public sector understanding of private sector needs and priorities and vice versa is limited. There is a perception amongst businesses and investors that opportunities to engage with policymakers on green investment issues are not sufficiently frequent, meaningful or transparent. For example, the regulatory framework under the RE & EE Law and the details of the JREEEF are perceived to have been developed by the government without sufficient involvement by the private sector. Likewise, there is a perception amongst government that the private sector is unwilling to act on government priorities without ever greater incentives.
- *Subsidies*. Electricity, petrol and water are currently subsidised by the government to a varying extent, distorting price incentives for green investment and project development, and the efficient use of

resources. Some subsidies cover over 50 per cent of the unit cost, whilst others are to the tune of 20 or 30 per cent. Reforms passed in November 2012 have included a rise in prices of petrol, diesel, kerosene and cooking gas, and previous reforms led to an increase in water tariffs for agriculture and, to an extent, for households. There are other subsidies in place, for example on wheat. Whilst recognising the success of recent reform efforts, similar attempts at the same in the past were less successful, raising doubts over the possibility of further removing subsidies.

As well as these generic barriers, which broadly apply across the green economy sectors, there are a number of specific barriers within the energy and water sectors (which we examine in particular for the same reasons as stated before. These are considered in the two following sub-sections.

4.3.1. Barriers in the energy sector

Barriers to the energy sector include:

- *Buyer power.* The electricity market is based on a single-buyer model, which reduces the negotiating strength of (renewable) power producers and can lead to lower returns than may be desirable or commercially viable. For instance, developers report that NEPCO, in its negotiations with project developers, is unwilling to pay more than $0.08 per kWh (the current heavily-subsidised retail price of electricity) to renewable energy project developers, regardless of the fact that the RE & EE Law reference prices, as discussed in Section 3.3.1 are substantially higher. These problems are compounded by a lack of an independent energy regulator.
- *Uncertainty surrounding NEPCO*. As discussed in earlier sections, NEPCO, the single buyer, is heavily indebted (by roughly $1.1 billion) due to the high subsidies implicit in the differences in the costs and revenues it gets from selling electricity. This creates unease amongst businesses as to the reliability of their returns, and amongst banks about the reliability of their investments
- *Jordan Renewable Energy and Energy Efficiency Fund.* The JREEEF established under the RE & EE Law within the Ministry of Energy and Mineral Resources is perceived by investors and businesses to be overly bureaucratic and insufficiently independent of government, in terms of the ring-fencing (or lack thereof) of the budget set aside for the Fund, the skills that the Fund will require to engage the private sector, and the type and effectiveness of support it will give to renewable energy and energy efficiency investment and project development. The private sector is thus sceptical of the potential of the Fund to have an impact.
- *Grid capacity and connectivity*. Grid connectivity for renewable energies is limited for technical reasons, and varies according to technology type, e.g. solar PV versus CSP versus wind, as well as by region.
- *Constraints on self-generation.* The regulations under the RE & EE Law dictate that the maximum connected capacity of renewable energy should not exceed 1.5 per cent of the maximum electrical load of each distributor, placing a cap on self-generation and on investment in distributed systems.

4.3.2. Barriers in the water sector

Barriers in the water sector include:

- *Lack of consensus over water sector plans.* There is an apparent lack of agreement between the key government institutions in the water sector over the Water for Life Strategy and the Water Sector Master Plan (USAID, 2012). This concerns both the validity of these plans, and who is responsible for which elements of them. It also concerns the basis for making decisions, gathering and sharing necessary information and knowledge, and measuring progress.
- *High administrative and technical losses.* Approximately 45 per cent of water supplied to consumers is non-revenue water, either for administrative or technical reasons. Administrative losses are due to the fact that water use is generally not metered (especially in agriculture) resulting in a reduced ability to secure accurate payment, and technical losses are due to poorly designed and/or maintained pipes and other infrastructure. Losses result in reduced water revenues and lower water efficiency incentives.

- *High water subsidies*. Water tariffs are below cost recovery levels and water consumption by households, farmers, industry and other consumers is heavily subsidised. Tariffs would need to approximately double to make the provision of water financially sustainable in terms of operations and maintenance, and to roughly quadruple to make substantial investments in upgrading necessary infrastructure.
- *Water supply in agriculture*. Inefficient and ineffective water supply to farmers is a particularly acute problem. The cost of water abstraction and distribution in the agriculture sector, which accounts for 70 per cent of total water use, is well below the cost recovery rate in terms of both permitting and use. Rising energy costs will exacerbate this problem.
- *Uncertainty surrounding Water Authority of Jordan*. WAJ, the overarching institution in charge of bulk water supply, distribution and waste water treatment amongst other things, is heavily indebted due to sustained and high subsidies. This is due to difficulties in controlling costs of energy and other inputs, and investments made in water supply and wastewater infrastructure. This is perceived as a risk for potential investors – whether at the levels of bulk water supply, waste water treatment or distribution – in terms of the certainty (or lack thereof) of being paid.

5. Overcoming financing barriers

This section outlines and evaluates some of the key options for overcoming the main financing barriers to greater green investment in Jordan. We interpret 'financing barriers' as factors that make it difficult for project developers and businesses to receive the capital necessary to undertake a particular green project. As such, it relates to the barriers discussed in Section 4.1 and Section 4.2 above. The narrow focus of this section – in line with the Terms of Reference – is complemented by the analysis in Section 7 which identifies a range of broader policy options for improving the business environment for green investment in Jordan.

A key challenge in identifying capital market interventions is to avoid badly targeted interventions that impede the proper functioning of capital markets. The role of capital markets is to allocate savings to those productive investment opportunities that deliver the greatest private and social returns. To achieve this, financial institutions need to be able to screen out, and not allocate capital to, poor investment opportunities, regardless of whether they are 'green' or otherwise. If they do not do this, then there is a risk that inappropriate investments are financed to the long-term detriment of the Jordanian population.

This suggests that the proposed interventions should be linked to identified market failures, i.e. factors that prevent the efficient allocation of capital by financial institutions. From the analysis in the previous section, the most important financing market failures that can be seen in relation to Jordanian green investment opportunities can be grouped into four main categories:

- *A lack of information and understanding amongst financial institutions which makes it difficult to evaluate loan applications.* The consequence is often that banks establish lending criteria that are perceived as being 'too' stringent by project developers, i.e. collateralised lending only, short-tenors and high interest rates. This is a generic barrier to much lending in Jordan but is particularly profound in the green sector for two reasons: first, many green investments are relatively new technologies and hence even more difficult for banks to evaluate. Second, a potentially disproportionate amount of green loan applications have characteristics that are particularly likely to be affected by these issues, for example, they require long-term lending, they are prepared by SMEs.
- *A lack of available capital.* The possible 'crowding out' of private sector (green) investments due to the high levels of government borrowing and the high interest rates at which government borrow. This has been, until recently, exacerbated by the lack of an approved Sukuk law to facilitate the involvement of the Islamic banks in the financing of green opportunities. However, as this has now been passed, we do not address this issue further.
- *A lack of information about, and understanding of, green investment opportunities and about how to prepare a bankable business plan or loan application amongst the business community.* This is a more specific green investment barrier.
- *Others.* Some people we have interviewed have claimed that tax rates on international lending may restrict this as a source of international capital, while international lenders express concern about latent currency risk.

In this context, we assess a number of interventions. They represent a combination of interventions identified in the original Terms of Reference, those suggested to us during our discussions with Jordanian stakeholders, as well as our own proposals based on international experience.

- Section 5.1 discusses the provision of technical assistance to potential project developers to develop 'green economy' loan applications and to financial institutions to appraise them;
- Section 5.2 outlines the creation of a loan guarantee scheme for green investments;
- Section 5.3 explores the possibility of relaxing prudential banking regulations e.g. reserve ratios, capital adequacy ratios in relation to green lending activities;
- Section 5.4 examines the scaling-up and altering the governance arrangements of the Jordanian Renewable Energy and Energy Efficiency Fund;
- Section 5.5 discusses reducing taxes on international lending/borrowing;

- Section 5.6 considers scaling-up of existing, or the creation of new, 'green' credit lines;
- Section 5.7 addresses loan softening programmes;
- Section 5.8 explores placing a green lending mandate on the Agricultural Credit Corporation;
- Section 5.9 summarises the findings.

In each section we discuss these interventions across a number of different dimensions.

- First, we identify specifically **which barrier(s) the intervention may help overcome**. Linked to this, we identify whether by design or in practice the intervention would be particularly targeted at, or restricted to, particular sectors or particular types of lending.
- Then, drawing on both **domestic and international experience**, we assess **how successful an intervention may be** at overcoming those barriers including identifying what pre-conditions there might be for its success as well as, where available, **quantitative evidence** of its success in other contexts[19].
- A further important indicator of the possible effectiveness of an intervention lies in the **views of Jordanian financial institutions**. These were elicited through a combination of workshops and a questionnaire disseminated to all 26 members of the Jordanian Banking Association. Questionnaire responses were received from 13 organisations.
- We then evaluate the **practicality of the intervention.** Interventions may be theoretically desirable but have significant practical challenges that would impede implementation. In other situations, there may be an existing framework or institution to which the intervention could be easily linked at low-cost.
- Closely linked to whether the intervention is practical is whether it is **politically attractive** in the current political and economic context, especially the need for fiscal retrenchment given the current budget deficit as discussed in Section 2.
- Finally, we assess whether there may be any **unintended (negative) consequences** of the intervention which may make it unattractive or which would otherwise need to be carefully managed.

Through this systematic evaluation, we derive a range of recommendations for overcoming the financing barriers to greater green investment in Jordan. As there is more than one barrier holding back financing of green opportunities in Jordan, a portfolio of different interventions is appropriate. At the same time, the more interventions proposed, the greater the risk of creating an overly complex environment in which stakeholders are not aware of the incentives.

5.1. Technical assistance to project developers and financial institutions

One option to support green economy investments is to provide technical assistance to project developers to develop green businesses and loan applications and for financial institutions to appraise these applications. Often (potential) project developers are unaware of the possibilities presented by the green economy or, even if they are aware of such possibilities, they are unable to develop a business plan and loan application that is credible from the perspective of financial institutions. Further many 'green economy' projects, such as energy or water efficiency projects, do not always correspond well with conventional functional divisions within banks making it difficult for banks to evaluate them. To overcome these barriers, programmes might aim to, among other things:

- Increase awareness about green economy opportunities through marketing and publicity campaigns about the green economy;
- Conducting energy or water audits within organisation;

19 Often these are measured in terms of leverage rates i.e. for every $1 of public money provided to the instrument, how much private investment may be expected. However, care is needed in assessing these leverage rates (CPI, 2011).

- Assist businesses, especially SMEs, in developing business plans and loan applications;
- Provide training to banks on the differentiating characteristics within and between different green economy projects and the implications for the products that they should offer;

There are a wide range of examples of such programmes being adopted around the world. Often technical assistance packages like these accompany other interventions such as those discussed in the rest of this section. For instance, the EBRD has established a series of Sustainable Energy Financing Facilities (credit lines) to support renewable energy and energy efficiency in more than ten countries in Central and Eastern Europe. A key part of this programme was the provision of technical assistance to support both loan applications and the appraisal of the loans. Likewise, the AFD typically provides technical assistance in conjunction with its credit lines in many countries.

The effectiveness of well-designed technical assistance programmes is generally high. As the creation of a deal-flow of well-developed business plans is a critical pre-requisite for financial institutions to be able to lend to green projects, such interventions can often have a major catalytic impact in increasing green financing. For instance, in a study by comparing twelve different ways to encourage low-carbon investment through public finance mechanisms[20] (PFMs), the only intervention that they classify as having a 'high' leverage potential are technical assistance facilities (UNEP, 2008). Consistent with this, the €2 million of technical assistance provided to support the EBRD's credit line for industrial energy efficiency in Ukraine had been associated with more than 70 times that value of investment (with roughly half financed by the private sector and half by the EBRD) (UNEP, 2009). The high predominance of SMEs in the Jordanian economy, where typically these constraints are more pronounced, suggests that this intervention could also be powerful in the Jordanian context.

Consistent with this, Jordanian financial institutions considered that this would be a valuable intervention. In a roundtable held with a range of Jordanian banks, this was one of a small number of interventions that garnered universal support from stakeholders. In the associated questionnaire, 90 per cent supported the use of technical assistance support to project developers (more than for any other intervention) and 50 per cent supported the provision of technical assistance for banks. Members of the business community, i.e. project developers and other green firms as well as associations, also expressed a high level of support for this intervention, in particular in relation to SMEs and the capacity of banks.

Technical assistance programmes are often provided or funded by bilateral or multilateral development partners; if this can be achieved in Jordan then it is likely to score highly on political acceptability. There are a diverse range of multilateral organisations that typically fund these activities including UNEP, UNDP, the GEF, as well as bilateral partners such as the GiZ, AFD and USAID. If such bodies were successfully encouraged to extend such a programme of support as part of their existing activities then the operational and financial responsibility of the Jordanian government would be low.

There are existing development partner programmes in some sectors of the green economy to which such an intervention could easily be added. The AFD, for example, is providing technical assistance to banks and project developers as part of its Renewable Energy and Energy Efficiency Credit Line.

Although there is a risk that a poorly designed or implemented programme may be less effective than desired, there seems to be little scope for unintended consequences.

In summary, this would appear to be an important intervention that the Ministry of Environment should seek to advance.

5.2. Loan guarantee schemes

Loan guarantees ensure that some portion of the loan and interest payments will be repaid if the borrower cannot make the interest or principal repayments. The provider of the guarantee, the guarantor, normally commits to repay somewhere between 50 per cent and 80 per cent. This reduces the risk that the lender

20 Public finance mechanisms are mechanisms in which public resources are used to support private sector investment, mainly by altering the risk: reward ratio for the private sector.

faces, allowing it to either advance loans to borrowers that it would otherwise not be willing to do so, or to reduce the interest rate on loans that it advances. The guarantor will typically charge a fee for providing a guarantee which may be paid by a combination of the borrower and lender. The fees for these guarantees can, like interest rates on loans, either be set on a fully commercial basis or, in the case of guarantees provided by a public sector body, could be set on a concessional basis.

A loan guarantee scheme could help to tackle the high risk perception that financial institutions have of green investments especially those made by SMEs. By substantially reducing the maximum losses a bank may face when extending a loan, guarantees make lenders more willing to provide finance to green projects. Brown and Jacobs (2011) discussing the application of loan guarantees to support low-carbon energy sources suggest that loan guarantees will be particularly effective in *'countries with high political risk, dysfunctional energy markets* [and] *a lack of policy incentives for investment'* reflecting the circumstances in which loan defaults are most likely. They may be particularly useful for SMEs for whom banks often have great difficulty in assessing credit risk. This is a particular problem in Jordan given its high preponderance of SMEs and results in banks setting high collateral requirements that potential borrowers find punitive. Loan guarantees may help to unlock this problem. However, they will not address an overall shortage of liquidity within a banking system and also require a minimum level of interest in the target sector among banks. Nor will they enable loans to be made to inappropriate or unprofitable projects.

There are a wide range of international examples of successful loan guarantee schemes to promote green investment. For example, in China, the International Finance Corporation has provided loan guarantees from the China Utility-based Energy Efficiency Program since 2007. This has provided four risk-sharing facilities with three domestic banks to support energy efficiency lending to utilities, equipment providers and energy service companies (ESCOs). Between 2007 and 2009 guaranteed almost 100 loans with a cumulative value of more than $500 million were given out (UNEP, 2011). Similarly, the AFD has an international loan guarantee facility, ARIZ, that provides guarantees either for individual loans or for a portfolio of lending activity by a particular financial institution: between 2008 and 2011 it provided guarantees for almost €400 million of lending activity across 26 countries (AFD, undated). Loan guarantees provided by international bodies such as these are typically accompanied by technical assistance facilities like those discussed above, to ensure sufficient deal-flow for the guarantee scheme.

There are loan guarantee facilities, without a green focus, that are already operating in Jordan. The Jordan Loan Guarantee Company, an organisation partly owned by banks and partly by the Central Bank of Jordan, provides loan guarantees for SMEs through two windows (one for small enterprises, one for medium-sized enterprises) covering up to 70 per cent of a loan's value. At the time of writing, it has an outstanding portfolio of around $60 million. It also has two special ring-fenced guarantee facilities, one backed by the EU to support manufacturing and one backed by the Ministry of Planning and International Cooperation (MOPIC) to guarantee loans made by the Development and Employment Fund for small entrepreneurs. In addition, the Jordan Enterprise Development Corporation (JEDCO) is offering guarantees using funds from OPIC in relation to SME lending, including a particular window focussed on information and communication technology.

The available evidence suggests that loan guarantees and can achieve apparent leverage rates of six to 15. For instance, within Jordan, the JLGC reports that its outstanding guarantee portfolio is more than four times the value of its shareholder equity and that it could increase this ratio to 8:1 without any problem. Brown and Jacobs (2011) report a leverage rate of six to ten for loan guarantees. UNEP (2009) reports that the partial credit guarantee scheme operated by the IFC in seven countries, achieved a leverage rate of 12 times to 15 times.

The current presence of loan guarantee providers in Jordan suggests that this intervention could be easily introduced into the Jordanian context. It is plausible that either JLGC or JEDCO could operate a specific green investment loan guarantee facility, akin to the dedicated windows for specific activities already provided by JLGC. If it wished to pursue this idea further, the Government of Jordan would need to decide which of these institutional homes is most likely to be effective in supporting its green economy ambitions. A further option, in relation to energy efficiency and renewable energy investments, would be for the facility to be provided by JREEEF, although the desirability of this will depend on the extent to which recommendations below are adopted.

It is unclear whether the resources needed to provide such a scheme would come from domestic sources or international development partners; in either event the high leverage potential makes it an attractive proposition to explore further. The Jordanian government has provided resources to loan guarantee schemes in the past, for example the resources provided by MOPIC to JLGC to guarantee loans made by

the Development and Employment Fund. Although the government's resources are currently stretched, loan guarantees, with their potentially high leverage rates, could be a prudent way to use scarce resources wisely. Alternatively or in addition, a number of development partners, such as the AFD, have expressed interest in guarantee schemes. The Paris Declaration Principles of System's Alignment would support these being supplied through Jordan's own procedures.

The key risk in providing loan guarantees is "adverse selection", that is, that only bad projects would be guaranteed. As loan guarantee schemes transfer risk from the lender to the guarantor, there is a possibility that banks will only choose to pass on the loans where such risks are greatest. This could lead to the scheme becoming financially unsustainable if a high number of risky loans default and the guarantees are called. However, both international and Jordanian experience suggests that loan guarantee schemes are most frequently used by banks when the *perception* of risks is high due to, for instance, a lack of knowledge about the sector but where, in reality, few lenders actually default. For instance, JLGC reports a failure rate of just 2 per cent.

In summary, loan guarantee schemes appear to be an important intervention that the Ministry of Environment should seek to advance.

5.3. Accelerating the scale-up of the JREEEF

The JREEEF is intended to assist with the financing of renewable energy and energy efficiency investments in Jordan. The long-term vision for the Fund envisages five windows (Government of Jordan, 2012):

- A renewable energy subsidy window to support the deployment of renewable power by closing the gap between production costs and power purchase agreement (PPA) prices;
- A window to promote studies and technical cooperation, for example feasibility studies, training, demand side management and programme development;
- A renewable energy and energy efficiency guarantee facility to promote bank lending to renewable energy and energy efficiency projects;
- A renewable energy and energy efficiency interest rate subsidy window which would reduce the overall costs to developers of these projects;
- An equity window to offer public-equity to managed investment funds.

As such, the JREEEF could be a potential vehicle to deliver many of the key interventions discussed above within one core sector of the Jordanian green economy. Given the central importance of this sector to Jordan's overall green economy ambitions, this focus would appear justified.

To date, progress in establishing the fund has been relatively slow with the establishment of the Fund in October 2012. The Fund currently has three initiatives: providing support to promote the switching from incandescent to CFL bulbs in public buildings, promoting switching from incandescent to CFL bulbs in the residential sector and installing more than 5000 solar water heating systems. **The fund requires more resources.** One option could be to explore whether future support from the Gulf Cooperation Council to support Jordanian renewable energy and energy efficiency investments might be channelled through the Fund. Given the leverage rates associated with many of the instruments proposed under the Fund, this could ensure that Gulf funds generate maximum value.

The JREEEF may have to directly provide more debt capital to projects. If the JREEEF was to receive substantial resources then the current shortages of lending capacity in the Jordanian banking system, coupled with some of the risk perceptions regarding renewable energy and energy efficiency projects, may justify the direct provision of debt by the Fund. This is the model that has been adopted by the UK's Green Investment Bank (as discussed in more detail in Section 6 below).

However, to engage the private sector at scale, the governance structure of the JREEEF may need to be amended. The JREEEF is situated within, and controlled by, the Ministry of Energy. This is likely to raise concerns among private sector developers that decisions (either to support or to withdraw support for particular projects) could be motivated by political considerations. There may also be cultural barriers between a government department and the private sector that are difficult to overcome. It is striking, for instance, that the UK's Green Investment Bank (GIB), which as discussed in more detail in the next section

and which can be thought of as a fund investing in particular green projects, has been made functionally independent from the British government.

The likely perception of the JREEEF among banks will depend on its particular operations. If the Fund provides facilities that reduce the credit risk of particular investments then this will likely be well received by banks. However, if the JREEEF started to directly provide capital then it would need to carefully develop procedures to ensure that it invested in a way that supported commercial bank lending operations rather than simply displacing them. The GIB case study, coupled with the experience of international financial institutions, shows how this might be done.

From a practical perspective, working with existing institutions in scaling up green investment may be easier than creating new ones. The attraction of this intervention is that much of the institutional set-up for the JREEEF is already established; the 'transactions costs' associated with the intervention should therefore be low. However, changing the governance structure of the Fund would require primary legislation, which could take a long time.

Scaling-up the resources of the JREEEF is politically possible if external resources can be found; adjusting the governance structure may be a longer-term endeavour. The use of external resources to capitalise the JREEEF is likely to be considerably less politically challenging than using domestic taxpayer resources. It has not been possible to assess the receptiveness of the GCC to the proposal that some of its future resources could be channelled through the JREEEF. However, as the Renewable Energy and Energy Efficiency Law establishing the JREEEF was only adopted in 2012, it may be politically challenging to amend its governance structure in the short to medium term. As this is likely to be fundamental to the long-term success of the Fund, this may make it a longer term option for scaling up financing to certain aspects of the Jordanian green economy. In the shorter term, efforts could be made to examine how to increase the operational independence of the management committee, especially regarding decisions over case-by-case fund applications, could be explored.

In summary, the JREEEF could play a crucial role in supporting the financing of the Jordanian green economy. However, to achieve this role, there are two (possibly three) critical preconditions:

- It requires substantially more resources which, given the current fiscal climate in Jordan, is likely to require external resources. The Government of Jordan may wish to pursue discussions with the GCC and other donors in pursuit of this.[21]
- Opportunities to explore how to increase the functional independence from government should be pursued - covering both operational procedures and practices in the short-term and statutory and regulatory changes in the long-term.
- It should explore whether the current constraints in lending capacity within the Jordanian banking system justifies the direct provision of loans.

While these should all be pursued, it is likely that this will be a long-term process. Therefore, other means to scale-up financing in the green economy will need to be found for the short to medium term.

5.4. Green lending mandate on Agricultural Credit Corporation

The Agricultural Credit Corporation is a dedicated lending facility to support farmers operating under the Ministry of Agriculture. In the recent past it has extended loans of around JD 30 million per annum. These loans are put out at an interest rate of seven per cent. In addition, it has two special lending windows where the interest charges are met by the Ministry of Finance:

- For promoting the use of greenhouses where its lending volume is typically in the region of JD 15 million per annum;

21 It has not been possible to assess within this project whether the GCC would be willing to support this idea.

» To promote the use of 'fertilised water' (which improves the efficiency of water use) where up to JD 10,000 can be lent without interest charges to the farmer with a total maximum loan size of JD 100,000.

In all cases its loans are for up to eight years. The last government injection of resources into the Committee was in 2008 since when it has operated as a revolving fund. At present, the Committee has spare lending capacity. It also has emergency facilities with the Central Bank that it can draw upon.

One option to stimulate green lending in the Jordanian economy would be to set a minimum target for the amount of lending that the ACC must dedicate to verifiably green investments in the agriculture sector. This would mean that a certain proportion of the ACC's funds would be directed into green projects. To begin with the dedicated proportion of funds would be part of the ACC's existing pool but it could at a later stage be supplemented by additional funds from the government or development partners. In order to preserve the ACC's flexibility, this floor could be calculated as a moving average over a, say, two to three year window so that if there was an acute challenge facing the agricultural sector in any one year, the floor would not prevent the committee from responding flexibly to that challenge. This would need to be accompanied by a marketing campaign identifying to farmers the benefits they could realise from taking out loans that met the verified standards, e.g. lower water and energy bills from more efficient irrigation equipment or the use of distributed solar power.

The dedicated focus on the agriculture sector can be justified by the sector's difficulty in accessing funding from the normal banking system coupled with the importance of changed agricultural practices to Jordan's green economy ambitions. The justification for establishing the ACC in the first place was to ensure sufficient access to credit for farmers who may otherwise be excluded from the financial system. For instance, USAID reports that only 1.4 per cent of bank lending goes to the agricultural sector despite its accounting for three per cent of GDP (USAID, 2012). As such, many of the other recommended initiatives discussed above may not be available to the agricultural sector. At the same time reform to the sector is vital for Jordan's green economy ambitions: the agricultural sector accounts for more than 60 per cent of Jordan's water use while the UNEP Scoping Study identifies investment needs related to sustainable agriculture of more than JD 100 million.

The cost of this intervention would be reduced if there are lots of projects that do not require interest rate subsidies. Although a full market scoping exercise would be required, the opportunity for profitable investments in improving water and energy efficiency in Jordan's agricultural sector is likely to be high. For instance, USAID reports that on farm water-efficiency is only 30 to 50 per cent (USAID, 2012).[22] If there were sufficient numbers of NPV positive projects then there would be no need to support this intervention with interest rate subsidies. If this was not the case - or, over time, as the 'low-hanging fruit' are exhausted - then it may be possible to combine this floor with a loan softening component, as discussed above and already in operation in relation to other aspects of the ACC's operations.

Practically, this should be an easy intervention to bring into operation. The Agricultural Credit Corporation is already established with a network of Jordanian farmers. All that this intervention would do is to mandate that a certain proportion of its lending activities would be directed to investments that met certain criteria (though at a later stage the funds available for this purpose could be topped up from government and/or development agencies). The main practical hurdle would be to establish firstly what these criteria should be and what proportion of its lending activity should be directed to these activities. However, in terms of the former, criteria based around water and/or energy savings should be relatively straightforward to develop (based on similar approaches for assessing whether projects meet energy efficiency criteria); in terms of the latter, a detailed market scoping study would be required.

If structured well, it should be possible to overcome political concerns. The major concern over this proposal is that it could divert resources from more pressing needs in the agricultural sector. However, as Section 2 above shows, reducing water use, which in large part requires action by the agricultural sector, is in itself a critical priority for the Jordanian economy. Furthermore, by allowing the floor to be assessed

22 Although as discussed below a market scoping exercise would be justified.

over a medium term average, it will still be possible to respond to other short-term requirements of the sector. A further political attraction is that, to start with, this intervention may not need to be supported by subsidies from the Ministry of Finance. Some financial resources would be required for the accompanying advertising campaign.

This would appear to be an important intervention that the Ministry of Environment and Ministry of Agriculture should seek to pursue.

5.5. Relaxing prudential banking regulations

Lighter prudential banking regulations on green loans would allow banks to extend more such loans for their given level of equity and/or deposits. There are two main options available:

- *Reducing the reserve ratio*. At present Jordanian banks must hold (either as cash or on deposit at the Central Bank) an amount equal to seven per cent of their consumer deposits (Gray, 2011); the remaining 93 per cent can then be lent out. A lower reserve ratio could be applied in relation to green lending, expanding the amount of lending that Jordanian banks can provide the green economy for every JD of customer deposits.
- *Reducing the capital adequacy ratios.* The capital adequacy ratio determines the percentage of equity buffer that a bank must hold as a proportion of its (risk-weighted) assets. At present, the ratio in Jordan is 12 per cent, in other words the bank must have an equity buffer equal to at least 12 per cent of its assets, (mainly its loan book). This places a limit on the amount that a bank can lend, and increases the bank cost of capital. It has been suggested that banks might be allowed to have a lower capital adequacy ratio with respect to green lending of perhaps eight per cent.[23]

This intervention would expand the potential supply of credit available for green investments. As discussed in Section 4 above, a key challenge that is holding back green lending in Jordan (or might do so in the future) is the limited overall lending capacity among banks. This stems from the high level of government indebtedness, a substantial proportion of which is held by Jordanian banks. The liberalisation of these regulations would extend the capacity of Jordanian banks to lend to the green sector, without needing to attract new customer deposits or raise new equity (both of which are expensive).

This approach to stimulating bank lending in the green sector is rare (for good reasons as discussed below), but there are some examples. For example, in Lebanon, energy efficiency and certain renewable energy projects are exempted from the national reserve ratio requirements of 15 per cent, subject to the overall reserve ratio of the bank not falling below 13.5 per cent. The precise amount of the loan that is exempted depends on the specific characteristics of the loan, for example what currency it is denominated in. There is also a cap on the proportion of the total project costs financed by a loan that can qualify for the exemption. In exchange for this so-called 'incentive loan' there is a cap placed on the interest rate that can be charged. There is little evidence available on the success of these arrangements that have only been in place since 2010.

A potential attraction of this model is that it could provide an incentive to stimulate lending in the green economy without expending scarce fiscal resources. In contrast to many of the other schemes discussed in this section, the approach would have no direct call on the government's resources.

However, it carries substantial risks. Firstly, it risks undermining the hard-won reputation of the soundness and prudence of the Jordanian banking system. As discussed in Section 3.2, the IMF (2012a) notes that *"the Central Bank of Jordan continues to exercise prudent regulation and supervision of the banking system ...* [and] *... the banking sector's macro-prudential indicators remain strong"*. A reduction in the amount of capital or reserves in the banking system might compromise this and send a negative signal about the

23 At the level of the bank as a whole, Basel III Banking Regulations III will require banks to hold 4.5 per cent of common equity (up from two per cent in Basel II) and six per cent of Tier I capital (up from four per cent in Basel II) of risk-weighted assets. In other words, the overall capital adequacy ratio will be 10.5 per cent. However, this relates to the overall equity holdings of a bank and different capital adequacy ratios could be applied to different assets so long as the overall capital adequacy ratio was consistent with these rules.

robustness of the sector, especially at a time when much of the rest of the international community is moving in the opposite direction. Secondly, by increasing the money supply, the measure risks contributing to higher inflation, which is already running at five per cent per annum. Both of these factors suggest that any measure in this regard should only be adopted cautiously and with careful limits in its application. That said, the low absolute level of green financing currently in Jordan suggests that such an approach could be used to stimulate a large absolute increase in the level of green financing (if other conditions are also conducive) while only having a relatively small macroeconomic impact.

In summary, lighter banking regulation is a risky option that should be applied very cautiously and carefully, and only with the full consent of the relevant regulatory authorities. As discussed in Section 4 above, one of the constraints limiting the financing of green investment appears to be the limited lending capacity of Jordanian banks given current regulations and taking into account the high levels of government indebtedness. This would be one way of overcoming this constraint. However, other options, such as substantially increasing the capitalisation of the JREEEF, and using this to provide debt or equity to renewable energy and energy efficiency projects, may be a preferable way of overcoming this constraint given the risks described with changing prudential regulations discussed above. Changes to prudential regulations might be considered only if increasing the flow of capital to green sectors, e.g. through JREEEF, is not considered feasible in the short-term and then only with careful limits and restrictions.

5.6. Reduce taxes on international lending

Jordan applies a withholding tax of 7 per cent whenever a Jordanian resident provides taxable income to a non-resident. This tax covers interest income paid by a Jordanian borrower to an overseas lender: in this case 7 per cent of the interest payments must be withheld and paid to the tax authority in Jordan. It can be expected that overseas lenders may increase their interest rates to Jordanian borrowers to account for this tax, effectively making it more expensive for Jordanian residents to borrow money from overseas. This may act as a disincentive on overseas borrowing which is one source of capital for green investments.

Similar withholding taxes are common in many other countries. The table below highlights a range of withholding taxes rates on international interest income for countries in the MENA region for which data was easily available. Although there are a range of countries who do not charge a withholding tax on interest income, a number of others charge rates higher than those of Jordan (for example Morocco, Syria and Egypt). Looking more broadly, withholding tax rates on interest income range between 0 per cent and 20 per cent.

Table 6: Withholding tax rates on international interest income

Algeria	10 per cent	Morocco	10 per cent
Bahrain	0 per cent	Oman	0 per cent
Egypt	20 per cent	Qatar	7 per cent
Jordan	7 per cent	Saudi Arabia	5 per cent
Kuwait	0 per cent	Syria	8 per cent
Lebanon	5/10 per cent	Tunisia	5 per cent (to banks) 20 per cent (otherwise)
Libya	5 per cent	UAE	0 per cent
Malta	0 per cent	Yemen	0 per cent/10 per cent

Source: Deloitte (2012) Withholding tax rates 2012 (available at: http://goo.gl/obNFC)

Often the impact of these tax rates is mitigated by double taxation agreements. These allow the international lender to offset the tax against their domestic tax liability and may reduce the impact of the tax on the rate that borrowers are charged.

One option to stimulate greater financing of green investments in Jordan would be to reduce this tax for green investments. This could have the greatest impact on larger projects, in particular renewable, as these are the projects that are most likely to seek capital from overseas. It would have no impact on the ability of Jordanian banks to finance green investments, or on likelihood of them doing so, except insofar as it increases competition between Jordanian and international banks.

The impact of the tax exemption are difficult to measure but the existing flows of international capital to support large-scale thermal generation in Jordan indicates that the withholding tax may not be a particularly great barrier where project economics are sound. Jordan is currently contracting at least four thermal power generation plants through independent power producers (IPPs), all of which have or will be financed by international investors and lenders. This suggests that, for the right projects, the withholding tax is having a relatively small impact on the ability to attract overseas (debt) capital into Jordan.

From a practical perspective, while it would be relatively easy to provide an across-the-board decrease in the withholding tax rates, it is less clear whether a selective decrease is possible. As seen above, at least five countries in the MENA region currently do not charge any withholding taxes on international interest payments. This suggests that an across-the-board decrease in the tax rate would be feasible. However, introducing a selective discount for lending to certain activities is much less prevalent and would have the disadvantage of making Jordan's tax code more complicated.

There would be a political challenge in getting agreement for any measure that substantially reduces tax revenues. The current fiscal climate in Jordan makes tax cutting measures difficult to implement.

In summary, this is unlikely to be a priority measure to increase green financing in Jordan. Given that Jordan's withholding tax rate on interest income is not exceptional by regional or global standards, the political and practical challenges in implementing a (selective) tax rate and the (admittedly somewhat limited) evidence that suggests these taxes are not a fundamental barrier on overseas financing, this measure does not appear to be a priority for increasing green financing in the country. It may be more fruitful for the Jordanian government to pursue double taxation agreements with a wider range of countries. When the fiscal climate is more conducive, an across-the-board decrease in withholding tax rates may be desirable.

5.7. Scaling up or new green credit lines

Dedicated credit lines could be used to scale-up lending to green sectors of the Jordanian economy. This option would aim to increase green financing by lending (at either reduced or commercial rates and/or terms) capital to Jordanian banks who could then on-lend this capital to green projects. This would increase green lending by making it more profitable for banks to lend to green projects (as the cost of funds for lending to these projects would be lower) and/or by increasing the length of time for repayment. As such, this approach might both address the lack of liquidity in the banking system for green investments as well as increase practical knowledge and understanding of these projects among project developers and the banking community.

Credit lines of this kind are common around the world, and one such arrangement for renewable energy and energy efficiency in Jordan already exists. The AFD has recently established a credit line for renewable energy and energy efficiency projects in Jordan, building on its experience in other countries, although to date only two projects have been supported by the credit line. However, in other countries, the AFD has experienced considerable uptake with, for example, three €20 million credit lines in China channelled through three different banks supporting the financing of more than 25 projects, with more than €25 million leveraged in support of more than 110 MW of renewable energy. Other examples include the Bulgarian Energy Efficiency and Renewable Credit Line (BEERCL) sponsored by the European Bank for Reconstruction and Development and an initiative by the Chilean Development Agency (CORFO). In the case of the former, the EBRD provided dedicated loan facilities of €50 million, rising to €100 million, to seven banks for on-lending to renewable energy and energy efficiency projects. The sub-borrower could borrow up to €2.5 million. As of April 2012, 184 projects with a total capital expenditure[24] of €180 million had been supported by BEERCL, leading to emission reductions of more than 650 million tonnes of CO_2 and energy savings of close to 1 terawatt hour. The CORFO credit line worked in a similar way with participating banks permitted to offer loans of up to $5 million for individual projects at rates of around 2.5 per cent per annum. This latter example has led to the deployment of over 80 MW of renewable power through support to 14 companies.

24 It is financed through a combination of the credit line and sponsor equity

These arrangements are frequently combined with technical assistance. For instance, the CORFO facility also includes project preparation grants for early stage project development measures such as resource assessment, feasibility and environmental studies. UNEP (2011) reports that the provision of technical assistance has been "an important factor in the success of PFM in deploying capital to projects". The technical assistance accompanying the BEERCL facility, and other similar EBRD initiatives in other countries, was discussed earlier.

The leverage rates associated with this support are often quite low. As this means of support involves the public sector directly providing capital to green projects, the leverage rates are often quite low. UNEP (2006), discussing the measure in the context of clean energy, reports a typical leverage rate of two to four. However, the same report also notes that this intervention is often 'necessary' to address the lack of liquidity for clean energy projects.

Credit lines generally have a good track record of increasing lending though the evidence from Jordan is so far mixed. As indicated by the Chinese, Bulgarian and Chilean examples above, green credits lines can effectively and substantially increase bank lending in the right circumstances. On the other hand, the AFD's credit line has only catalysed two investments to date.. Admittedly the AFD's credit line is still young and may pick up. But it remains to be seen whether other investment barriers in Jordan will limit the impact of a credit line approach, including increasing SME lending.

There are challenges in setting up credit lines, but they are not insurmountable. The widespread use of these schemes around the world indicates that the challenges in establishing and running these schemes can be overcome. An important practical issue to address would be the choice of banks involved in the scheme and the determination of the criteria for a 'green project' so as to ensure that any resources are allocated appropriately.

While an existing renewable energy credit line is in its early stages, this may not represent a priority for the Government of Jordan in relation to its own resources. To date, the AFD credit line scheme has only supported two projects. While this scheme is still in its early stages and the appetite for its use among banks and borrowers is still subject to uncertainty, it is unlikely to be prudent for the Government of Jordan to create a new scheme or to scale-up an existing scheme, although there may be other development partner initiatives in this area. Furthermore, in the event that the scheme was sponsored by the Government of Jordan, even though it would ultimately receive a return on the funds that it might commit, short-term cash-flow considerations might prevent it from committing resources.

One of the major risks from a credit-line scheme is the perception that that banks rather than end-borrowers gain. The lower interest rates offered on any credit line to a bank will be shared between bank and end-borrower depending on the competitive conditions in the banking market. If the market is not very competitive then most of the benefits will be retained by banks who will continue to offer loans to end-borrowers on similar rates as they would have done without the credit line. Although this can still be consistent with the overall objectives of the scheme (as the higher profits that banks can realise from lending to green activities will make them more willing to lend than otherwise), it may call the political legitimacy of the scheme into question.

In summary, from the perspective of the Government of Jordan, it may be desirable to gain further experience with the existing AFD credit line for renewable energy and energy efficiency projects, and take lessons from this, before proceeding any further with an intervention of this type.

5.8. Loan softening programmes

There are a range of subsidy instruments that are available to soften the terms on which borrowers can access capital. These instruments provide subsidies to banks so that they may reduce the interest rate or extend the duration of the loan; or directly to borrowers to help them meet interest costs. As such, they indirectly address the problem that, as a result of the difficulty that financial institutions have in obtaining and appraising information about green investments, they are only willing to offer loans on terms that borrowers find difficult to meet. These instruments can also address concerns about the affordability of interest repayments for borrowers.

There are a number of these programmes around the world, as well as schemes proposed for Jordan. For instance, in India, the Ministry of New and Renewable Energy (MNRE) has used this scheme to help Indian banks lend to solar water heater suppliers while UNEP has adopted this approach to promote the solar water heating market in Tunisia. As discussed above, the JREEEF envisages an interest rate subsidy window which would reduce the overall costs for developers of renewable energy and energy efficiency projects.

Typically, these measures are introduced in relation to supporting loans for particular investments so that the subsidy amount can be carefully calibrated.

These initiatives tend to be most effective at stimulating medium to small scale projects. Smaller projects limit the amount of subsidy needed per unit and the political challenges of introducing subsidies are often less acute for small and medium size projects than larger ones. In the case that the subsidy is channelled through a bank, the banking system needs to be reasonably competitive in order to ensure that the subsidy is passed through to the end-borrower. Subject to these caveats, the international experience with these sorts of programmes is reasonably positive: UNEP describe the leverage potential of these schemes as 'medium'. In the example of Tunisia's solar water heating market, the scheme was able to increase the scale of the solar water heating market by 800 per cent over three years (UNEP, 2009).

Jordanian financial institutions suggest that the interest rate itself is less of a barrier to agreeing financial terms than short loan tenors. When asked what was holding back their financial institution from lending more to the green economy only twenty per cent of respondents suggested that there was a problem in agreeing an acceptable interest rate with the project developer. However, around forty per cent noted that finding agreement on the loan tenor was more of a challenge. This suggests that a subsidy scheme that targets length of loan tenor rather than the interest rate itself may be more important.

There are both practical and economic challenges in implementing these schemes. The tendency for these schemes to focus on smaller scale projects can make setting up and administering the system of verification (needed to ensure that the loan has been disbursed to a qualifying investment) challenging. For instance, in the case of the interest rate and associated subsidies provided by the MNRE in India to stimulate solar water heating activity, it can take on average about six to 18 months for the subsidy application to be processed and verified and for the funds to be disbursed.

The subsidy requirement for such schemes makes them fiscally difficult to implement in Jordan at present. An increase in the direct provision of subsidies by the government of Jordan will be difficult to agree upon in the short-medium term, especially given the current political and fiscal climate and the recent removal of fuel subsidies. International development partners may be willing to support such initiatives for discrete, identified investments where there is clear evidence that borrowers, particularly households, would otherwise be unable to meet typical loan repayment schedules.

There are two potentially damaging/unintended consequences from such a scheme. First, there would be concerns if the scheme was administered through the banking system but was (perceived as) not bringing benefits to borrowers. There would be many administrative advantages in channelling such a scheme through the banking system as the scheme administrator would only have to interact with around 20 to 30 banks rather than a large number of end-borrowers. However, in cases where there was a concern that the banking market is uncompetitive, it would need to be carefully monitored to ensure that the subsidies were being passed through to end-consumers. Second, and in-line with a number of other finance-focussed approaches, it may distort behaviour towards capital-intensive solutions over behavioural solutions that could achieve the same objectives at lower cost. This may be particularly likely in relation to loans for water and energy efficiency improvements.

In conclusion, if used in a selective targeted manner this intervention might have a role to play in supporting specific green investments, especially those made by households or SMEs., and if funding were made available by development partners. In this way the subsidy requirement could be restricted and calibrated relatively easily; and as such it may be possible to find international development partners who are willing to support it. It may be focused as much on lengthening loan tenors as reducing interest rates. However, the characteristics of the intervention do not support its broad use across a large number of different investments, and the current political and fiscal context in Jordan would make it unfeasible for the government to provide budgetary funds.

5.9. Summary and conclusions

Table 7 below summarises the preceding analysis. It assesses each of the eight interventions considered across eight different dimensions.

The key conclusions from this analysis are that to encourage financing of green investments, the Government of Jordan should consider the following activities.

- **Provide technical assistance to both (potential) developers of green projects and financial institutions who appraise them.** This need is clearly identified by Jordanian financial institutions and project

developers, has been shown to be effective internationally, and is likely to be particularly important given the high predominance of SMEs in the Jordanian economy. Resources may be available from international development partners.

- **Create a specific green-economy loan guarantee facility.** The Jordanian banking sector is almost exclusively based on collateralised lending; in other words there is little or no unsecured lending, especially for SMEs, because is very difficult for banks to evaluate the underlying creditworthiness of projects or businesses. However, this can represent a significant challenge for many SMEs who often lack collateral. A specific loan guarantee facility for green investments could help to overcome this. International experience demonstrates the effectiveness of this intervention in leveraging private sector investment and there is an existing architecture in Jordan which it may be possible to build on.
- **Accelerate the implementation of the Jordan Renewable Energy and Energy Efficiency Fund.** Based on international practice, to become truly effective, the Fund needs:
  - **A substantial injection of resources –** discussions with the Gulf Cooperation Council over its support to Jordanian renewables may be pursued.
  - **To have greater functional independence from of government –** the private sector will otherwise be concerned by political interference. There could be a focus both on exploring what changes could be made in the short-term to operational practices to provide greater autonomy to the management committee as well as possible longer term statutory changes.

  In addition, if JREEEF receives sufficient resources then it may also look to provide debt directly to projects if the lending capacity of Jordanian banks continues to be restrictive.
- **Establish a minimum floor of lending to the green economy by the Agricultural Credit Corporation.** This is relatively easy to implement and will ensure that a sector that is crucial to the green economy but partly excluded from the formal banking sector is not overlooked.

These interventions would cover all key sectors in the green economy and all sizes of firm. For instance technical assistance and loan guarantee facilities would be generic across all green economy sectors. The particular focus on JREEEF and the Agricultural Credit Corporation is appropriate given both the importance of the energy and water sectors to Jordan's green economy ambitions. Further, while the interventions could be open to all size of firms, it is likely that the technical assistance and loan guarantee facilities will be particularly important to facilitate lending to SMEs. The ACC proposal ensures that farmers, sometimes excluded from the formal credit sector, are still able to access loans to support the green economy.

There are then some interventions which may be pursued further but will only have time-limited or sector-specific relevance.

- A relaxation of prudential baking regulations carries substantial risks and would have to be approved by the relevant regulatory authorities. But it may be a possible short-term option if the level of government borrowing continues to limit liquidity in the Jordanian banking system and placing substantial resources in an independent JREEEF is politically challenging. This would need to be carefully limited so that the aggregate level of risk to bank depositors only increases marginally.
- Loan softening options may be considered for specific types of investments, especially those made by households. International development partner money has supported these activities in other countries.

Finally, there are some interventions that were proposed but which, on balance, are not considered to be priorities.

- Reducing taxes on international lending is unlikely to be politically feasible and potentially not very effective. Double taxation agreements with key countries where Jordan does not have such arrangements in place would appear to be more important.
- The Government of Jordan may wish to defer any decision on new credit lines to support the green economy using its own resources until there is more evidence on whether or not the AFD credit line for renewable energy and energy efficiency has been a success.

Table 7: Summary of interventions

Proposed intervention	Barrier it would overcome	Sectoral focus	Precedents	Evidence on effectiveness	Views of Jordanian banks	Practicality	Political feasibility	Unintended side-effects	Overall assessment
Technical capacity for project developers and banks	Lack of knowledge on how to prepare and appraise green economy loan applications	All green economy projects/sectors. Main benefit to SMEs	Various – often tied to other interventions. For example, EBRD BEERCL	Only intervention rated as 'high' by UNEP (2009)	Strongly supported (90 per cent in favour)	Many experiences to draw upon	High – especially if resourced from development partners	Limited	Priority intervention
Loan guarantee facility	Banks impose high collateral and interest requirements as are uncertain appraising project risks and cash flow	All green economy projects/sectors.	China Utility based Energy Efficiency Programme Jordan Loan Guarantee Corporation	6x – 15x	Supported (60 per cent in favour)	Easy to build on existing Jordanian architecture	Maybe a challenge to find domestic funds but high leverage potential makes it possible.	Some risk that only bad projects may be asked to be guaranteed.	Priority intervention
Relaxing prudential banking regulations	Lack of liquidity in Jordanian banks	All green economy projects/sectors.	Lebanon – energy efficiency projects exempted from national reserve ratio requirements	Not documented	Supported (60 per cent in favour)	Previous experience in Jordan but evidence from Lebanon suggests needs careful and often bureaucratic management	Moderate/high given no fiscal impact. Possible negative reaction from international organisations	Potential for increasing risks of banking sector	A possible short-term option if bank lending capacity continues to be restrictive but needs careful regulation.

Proposed intervention	Barrier it would overcome	Sectoral focus	Precedents	Evidence on effectiveness	Views of Jordanian banks	Practicality	Political feasibility	Unintended side-effects	Overall assessment
Accelerating the scale-up of JREEEF (and addressing governance weaknesses)	Lack of liquidity in Jordanian banks Lack of knowledge on green economy issues	Renewable energy and energy efficiency	UK Green Investment Bank	Depends on precise intervention	Not asked	Institutional set-up complete but attracting resources and altering governance structure may take time	Potential lack of political appetite to change governance structure	Some risk that it could crowd out existing private sector banks	Should proceed but recognising that key benefits may only flow in the medium to long term
Reduce withholding tax on interest paid to overseas lenders for green/all projects	High cost of capital for foreign debt	Main impact would be on larger projects e.g. grid connected renewables	Various MENA countries have lower or zero rate tax. Fewer (no) examples of selective reductions for certain projects	Not documented but evidence of foreign capital coming into Jordan for other projects	Not asked	Across-the-board decrease easy to implement	Reduction in tax revenues difficult to introduce	Selective reduction for green projects further complicates tax code	Not a priority due to political difficulties and uncertainty over effectiveness

Proposed intervention	Barrier it would overcome	Sectoral focus	Precedents	Evidence on effectiveness	Views of Jordanian banks	Practicality	Political feasibility	Unintended side-effects	Overall assessment
Scaling-up or creation of new green credit lines	Limited bank liquidity for green projects Bank uncertainty over projects leading to high interest costs or other terms Limited knowledge of green investment opportunities	Scale up: renewable energy and energy efficiency New: potentially all green sectors	Various including existing AFD credit line in Jordan, EBRD scheme in Bulgaria	Direct use of capital in projects leads to relatively low leverage. UNEP (2009) reports 2x-4x	Moderate support (50 per cent)	Plenty of experience in Jordan and elsewhere suggests limited practical challenges	Difficult for government to find resources at present. Development partners may prefer to see whether AFD credit line is effective before committing more resources	Insufficiently competitive banking market may lead to banks rather than borrowers being main beneficiaries	Not a priority – better to evaluate whether existing AFD credit line is a success before committing more resources
Loan softening programmes	High cost of capital and long tenors for borrowers	SMEs, households across all Likely to need calibrating specifically for different investments	India MNRE scheme to support SWHs UNEP SWH scheme in Tunisia	Reported by UNEP (2009) as having 'medium' leverage potential	Not asked	Some difficulties in monitoring and verifying eligibility can lead to implementation delays	Difficult to find taxpayer resources at present. Development partners may support discrete schemes	Insufficiently competitive banking market may lead to banks rather than borrowers being main beneficiaries	May have a role to play for specific investment types, especially for households and SMEs

Minimum lending floor to green economy in ACC	Lack of agricultural engagement in formal banking system Lack of awareness of green investment opportunities	Agriculture with a particular bearing on water consumption	None that we are aware of	Should be a 1:1 relationship to whatever minimum is established.	Not asked	Relatively straightforward. Main challenge would be to set the appropriate threshold and market scoping exercise	Concern if green lending crowds out other ACC lending activity. Less of a concern if lending requirement calculated over 2-3 year average Fiscal impact depends on whether subsidies required	Concern if green lending crowds out other ACC lending activity. Less of a concern if lending requirement calculated over 2-3 year average	Priority intervention to ensure farmers also participate in green economy transition

Source: Adam Smith International and Vivid Economics

6. Case studies on promoting green investment

This section provides four case studies on programmes or initiatives aimed at scaling up green investment from around the world, each of which provide important lessons in the context of Jordan's own green economy ambitions. The four case studies are:

- Section 6.1 discusses the UK Green Investment Bank
- Section 6.2 explores Scotland's Renewable Energy Investment Fund;
- Section 6.3 examines Hungary's Energy Efficiency Co-Financing Programme (as an example of a loan guarantee programme focussed on the green economy)
- Section 6.4 outlines the Eco-Cities of the Mediterranean programme

Each case study broadly adopts the same structure. We first set out the motivation or rationale for the intervention, then discuss the way in which the intervention is/was organised and structured as well as any results before concluding with the lessons for Jordan.

6.1. The UK Green Investment Bank

The first case study discusses the motivation and experience of the UK in setting up a dedicated Green Investment Bank. Although the socio-economic and environmental context is different, Britain's GIB case has many interesting parallels to the situation in Jordan. In particular, the GIB was specifically set up to address financing barriers to investment in the green economy, thus addressing the exact same concerns as this study. Moreover, the GIB has a potentially broad remit that could in principle cover all aspects of the green economy. This is again in line with Jordan's aspirations.

Motivation for setting up the GIB

The UK has far-reaching green economy targets. Perhaps the most visible and ambitious of these is a statutory commitment, enshrined in the 2008 Climate Change Act, to aggressively decarbonise the UK economy. There is a legally-binding target to reduce greenhouse gas emissions by 50 per cent (relative to a 1990 baseline) by 2025. There are additional green economy targets, many of them derived from EU legislation, relating to renewable energy, waste management, water quality, climate resilience and other aspects of the green economy. The fact that many of these ambitions have a firm legal basis is important. It provides legislative certainty and helps to guide both policy and investment decisions.

The GIB is one of many policy instruments the UK has in place to build a green economy. The UK has put in place a wide array of policies and regulations to advance the creation of a green economy. They include: price instruments (such as a climate change levy and a landfill tax); trading schemes (the UK is part of the EU Emissions Trading Scheme); technology subsidies (for example, for renewable energy and electric cars); supplier obligations on energy companies; mandatory reporting (for example, on the energy performance of buildings and companies' preparedness for climate change); and much else. Each instrument addresses different aspects of, or removes particular barriers to the green economy. The GIB needs to be seen, and can only be effective, as part of this wider policy package.

Within this policy mix the GIB addresses a specific set of barriers related to investment in the green economy. There was recognition in the UK that even with adequate pricing and regulatory policies an additional policy instrument was needed to facilitate access to finance, which had become more difficult to obtain in the course of the financial crisis. To illustrate the point, the, UK currently invests about £8 to 10 billion a year into green infrastructure, most of it through private companies. Estimates of green investment needs suggest that this number will have to increase to perhaps £30 to 50 billion by 2030 (Vivid Economics, 2011). This ramp up comes at a time when total investment in the UK is at a long-time low as a result of the financial crisis.

Organisation and design

The idea of a GIB was first mooted in 2010, and the bank was formally established in the autumn of 2012. Proposals for a green investment bank, or perhaps an infrastructure bank, were in the manifestoes of all major political parties during the 2010 election campaign. Preparatory work started soon after the election, with detailed due diligence on scope, organisational aspects, legal aspects, economic justification, value-for-money, financial and budgetary implications, and much else. While this work progressed, a small "shadow GIB" started operating within the Department for Business, Innovation and Skills to prepare deals and make

sure the GIB would hit the ground running. The GIB started formally operating in the autumn of 2012. It is headquartered in Edinburgh, Scotland, although it is expected to have a strong presence in the City of London, Britain's financial centre.

The GIB operates at arms' length from the government. Although state-owned, the GIB is an independent institution with its own management and governance structure. The management and board are dominated finance experts and bankers to ensure the GIB has a commercial outlook and mindset and 'speaks the language of the market'. It will have its own staff and develop its own investment, legal and risk management procedures, although it reports regularly to its main shareholder (the state) and may be subject to government audits. The CEO, Chairman and members of the board were appointed in mid-2012 and have started their work to set up the internal management structure of the bank.

The GIB has an initial capital base of £3 billion provided by the government. Importantly, the GIB is not allowed to raise further capital from the financial market until at least 2015, when this decision will be reviewed. Allowing the GIB to go to the market – for example by raising bonds – could be an effective way of leveraging further capital. However, there is concern within the UK Treasury that the GIB's debt would *de facto* be underwritten by the government and would therefore count against the government's public debt targets.

The GIB has to comply with strict rules about state aid. An important concern among investors and officials is that the GIB does not create an unfair advantage for some businesses over others. It has to operate in a way that maintains a level playing field within the market, between different technologies and firms and – within an EU context – between Britain and its trading partner. The GIB is therefore subject to strict state aid rules. Obtaining state aid approval is a time-consuming process and in the intervening time the GIB will offer only products that are consistent with market principles and do not contain a subsidy element. It is telling that there is a sufficient flow of deals where the GIB can make a difference without the need for subsidies.

The GIB will have strict monitoring procedures to establish its additionality and value-for-money. It is an important criterion that the GIB is financially additional. That is, it does not crowd out private banks from deals they would have been willing to finance. Instead, the GIB should crowd in private finance, by structuring transactions and sharing risks in a way that makes private banks comfortable to participate in green transactions alongside the GIB. How the balance between crowding out and crowding in is struck is difficult in practice, but the GIB will be subject to strict monitoring on its additionality.

Products offered by the GIB

Although the scope of the GIB is broad in principle it has to set clear sector priorities. In principle the GIB could have a broad remit across most aspects of green infrastructure. In reality, the bank will have to set clear priorities in order not to spread its resources – both financial and administrative – too thinly. In a first instance the GIB will support offshore wind, non-domestic energy efficiency (complementing another support programme, called the Green Deal) and different aspects of waste management. These are considered to be the priority areas for Britain's green agenda at the moment. Onshore wind developers, for example, or generally better able to access finance and are therefore not a GIB priority. It is likely that priorities will evolve over time, and that the GIB will transition out of market segments that have matured faster – perhaps near-shore wind, or plain vanilla debt – and into others where progress has been more slow.

In addition to setting sector priorities, the GIB has to carefully target its support to provide the right type of finance. Capital is not homogenous. There are big differences in risk profile, availability and the skills needed to structure a transaction, for example between construction equity provided at the outset of a project and working capital provided in the operation phase. The GIB will have to understand clearly where the financing gaps are and where demand for its capital may be greatest. That is why it is important for the GIB to be a commercially-oriented organisation, staffed by finance professionals who understand the market and know how to structure a transaction.

The GIB has yet to finalise its operational principles and the products it is willing to offer. For example, the management and board have yet to decide on the bank's approach to higher-risk products like equity. However, the guiding principles for making product decisions are fairly clear. The GIB will:

- Work with the private sector by establishing confidence and encouraging joint lending;
- Provide funds on market terms although concessionary funding may be available subject to State Aid approval;

- Offer senior and mezzanine debt, as well as perhaps equity, guarantees and assistance in developing new products;
- Not provide grants or regional assistance, venture capital or development equity;
- Not be a 'lender of last resort' and will not take the wholesale transfer of tail end risks for projects;
- Act as a catalyst for encouraging the existing banking market to lend to these more challenging sectors;
- Maintain flexibility and be able to respond to changing market needs.

Lessons for Jordan

The GIB started its operation very recently and can therefore not offer many operational lessons. However, the set up and implementation from starting the planning to getting the bank off the ground offer valuable insights for Jordan. Similar financial institutions, such as the KfW in Germany or the European Investment Bank (EIB), can be used to provide operational lessons to complement the insights on the structural and organisational side.

The process of setting up a well-designed and operational financial institution dedicated to green finance takes time; in order to start the transition to a green economy early, interim arrangements may be necessary. In the UK, the establishment of the GIB – which itself was relatively quick – was paralleled by the activities of UK Green Investments (UKGI). Mirroring the objectives of the GIB, UKGI undertakes green investments on market terms to, at a minimum, increase the available capital. Such interim arrangements can potentially reduce information asymmetries as every transaction increases the insight into green investments and can serve as a basis to attract and train capable personnel.

Financial market failures provide the economic justification and background for the existence of the GIB. Even the relatively sophisticated financial markets in the UK fail to provide sufficient capital for renewable energy and energy efficiency investment. This for two reasons: first, financial institutions struggle to price the risk associated with large scale renewable investments and energy efficiency measures appropriately given the relative novelty of these projects. Second, available capital for debt, equity and other financial instruments is relatively scarce in the aftermath of the financial crisis and further capital requirements imposed by Basel III contribute to the scarcity. The available capital is quickly used for more traditional investments that are perceived to be less risky.

The GIB can only be successful if it is part of a wider set of policy instruments, including renewable energy support and a price on carbon. Green investments create positive externalities such as carbon reductions that are not priced by the market unless other policy instruments achieve this. Pricing these externalities will bring the returns of green projects closer to other conventional projects and therefore encourage investment. A combination of accounting for the positive effects of green investment on a broad basis as well as direct intervention by the GIB are necessary to achieve the UK's ambitious sustainability targets.

While providing additional capital, great care is warranted to ensure the investments complement rather than substitute market investment. This concern about "additionality", in turn, determines the type of products the GIB and other institutions can offer to not crowd out private investment and be able to move in and out of areas suffering under financial market failures.

To gain credibility in the market, it is important for institutions like the GIB to be at arm's length from government. This is to avoid the risk of directed lending and to have a credible commercial culture and operational principles. A credible investment institution needs to be able to relate to investors and be on an equal footing with commercial banks. This needs to be reflected in the product it offers, the operational principles and the personnel choices.

One of the most important lessons for Jordan in its current situation is that setting up the GIB had financial implications on the borrowing capacity of the sovereign, since the state will most likely underwrite the bank. This can be alleviated by getting international donor support such as IFI finance or the support of neighbouring countries.

Monitoring and evaluation are important for its success. There is an inherent clash between the objectives of the government (which values positive externalities, overcoming market failures, value for money, additionality of investments and so on and so forth), and investors (who think in terms of financial returns,

risks, deal flow and so on). A strict monitoring regime is essential to address this trade-off, without stifling the commercial instincts of the bank.

6.2. Scotland's Renewable Energy Investment Fund

The second case study discusses the motivation and experience of the Scottish Government in setting up the Renewable Energy Investment Fund (REIF).

This multi-million pound renewable energy investment fund, which is geared to stimulating greater levels of private finance into innovative green power and renewable district heating projects in Scotland, opened for business on the 10th October 2012. It provides lessons on setting up a narrow, specialised fund dedicated to a particular aspect of the green economy.

Motivation for setting up the REIF

Scotland has ambitious green economy targets. The Scottish Government's target is to meet the equivalent of 100 per cent of gross annual electricity demand from renewables by 2020. Statistics published in March 2012 show that the amount of renewable electricity generated in 2011 rose 45 per cent on 2010 to 13,750 gigawatt hours. Assuming gross consumption in 2011 is similar to 2010, this would indicate that around 35 per cent of Scotland's electricity needs came from renewables in 2011, beating the Scottish Government's target of 31 per cent.

The Scottish Government received £103 million from the UK government. This is Scotland's share of a levy paid by suppliers of electricity from non-renewable energy sources in the United Kingdom, known as the Fossil Fuel Levy, and was passed on the condition that the funds would be used solely for the promotion of the renewable sector in Scotland. These funds have been used to create the REIF. The sectors identified were: community renewable energy, marine renewables (i.e. wave and tidal power) and district heating, with the flexibility to incorporate other sectors as appropriate.

The main aim of the REIF is to promote the use of energy from renewable sources and drive further investment into key areas of Scotland's renewables industry.

The Scottish government's policy is to position Scotland among the world's key destinations for investment in low carbon technologies and to build on its long-established reputation in engineering, innovation and financial services. It is hoped that REIF will help leverage further significant private finance into key areas of the renewables sector where specific funding gaps have been identified.

Organisation and design

The REIF is delivered by the Scottish Investment Bank (SIB), part of Scottish Enterprise, on behalf of the Scottish government and its enterprise agencies.

Scottish Enterprise is a sponsored, non-departmental public body of the Scottish government which encourages economic development, enterprise, innovation and investment in business. The body covers the eastern, central and southern parts of Scotland whilst a similar body, Highlands and Islands Enterprise, operates in north-western Scotland. Scottish Enterprise is largely funded by the Scottish government, although it also raises part of its budget from other sources such as property rental and disposal of assets. Scottish Enterprise's budget for the financial year 2010/11 was approximately £280 million.

The SIB supports the development of Scotland's private sector SME funding market to ensure both early stage and established businesses with growth and export potential have adequate access to growth capital.

Products offered by the REIF

The REIF is designed to complement existing public and private sector finance schemes available in Scotland, providing bespoke investment deals that typically involve loans, loan guarantees and equity finance alongside co-investment partners. Whilst loans and equity are provided on a fully commercial basis, the REIF is able to become involved at an earlier stage than commercial entities and can consider taking some development risk. Opportunities will be considered on a case-by-case basis. Some early transactions have already been approved.

The REIF will be complementary to other initiatives which are already operational in Scotland such as the £18 million Marine Renewables Commercialisation fund, the £70 million National Renewables Infrastructure fund and the Community and Renewable Energy (CARES) scheme.

It is hoped that the REIF will not only help accelerate Scotland's progress in key sub-sectors of the renewables industry, but will be pivotal to unlocking greater investment from the private sector by sharing the risk through co-investment and co-lending. Alongside private sector parties, the REIF will provide innovative interventions tailored to individual project requirements and is expected significantly to accelerate access to finance for key projects in the renewables sector that have demonstrable funding gaps.

Designed to complement existing public and private sector finance schemes currently available in Scotland, the focus for the REIF's £103 million is to provide loans, equity investments and guarantees (but not grant funding) for projects that will either:

- Accelerate the growth of the marine renewable energy sector in Scotland;
- Increase community ownership of renewable energy projects in Scotland (including stakes in commercial schemes);
- Provide for district heating networks that utilise renewable heat technologies like heat pumps, biomass boilers and solar thermal panels and other renewable energy projects.

The REIF will also consider projects in other areas that support the delivery of energy from a renewable source or are an innovative renewable energy technology.

Lessons for Jordan

REIF has only just opened for business but work was undertaken beforehand to identify a pipeline of potential business opportunities that were candidates for funding once the credit and review process had been established. This resulted in a small number of community projects receiving prompt funding, enabling the projects to progress quickly and creating interest in the REIF's activities.

The REIF is seen as an enabler or catalyst providing funding to good projects which are considered at too early a stage to attract conventional commercial funding from traditional sources, such as commercial banks. It is the aim that these projects will be refinanced at a later stage once they are established, returning the funds to the REIF for relending to other projects.

The REIF and SIB work with the private sector, both developers and banks, as a partner, bringing its substantial skills to bear in enabling good projects to go ahead for the benefit of the community and for Scotland as a whole.

Although part of the Scottish Government, both the SIB and REIF operate on a wholly commercial basis and are subject to independent audit by Audit Scotland.

6.3. Hungary Energy Efficiency Co-Finance Programme

The penultimate case study discusses the motivation, experience and resulting lessons for Jordan in setting up a credit guarantee scheme in Hungary to encourage energy efficiency investment. Energy efficiency measures face similar barriers throughout different economies such as the inability to account for externalities and the lack of expertise in funding energy efficiency, both in the side of financial institutions as well as on companies applying for energy efficiency loans. Credit guarantee schemes are one method to overcome these barriers as well as idiosyncratic barriers arising in the Jordanian context. This case study provides the motivation, the operating principles and products offered and the outcomes to provide lessons for Jordan.

History and motivation for a credit guarantee scheme

The Hungary Energy Efficiency Co-Finance Programme (HEECP) is set up by the IFC and GEF to encourage financial institutions in Hungary to fund investments into energy efficiency. The HEECP is split into two rounds and builds on previous initiatives. The first HEECP is a $5 million pilot project to assess the potential of credit guarantee schemes in Hungary. It is followed by the second round, HEECP2, with a combined GEF and IFC credit guarantee pool of $16 million to facilitate up to $76 million in energy efficiency financing. The programme is extended to 2008 to include the Commercializing Energy Efficiency Finance (CEEF) project (GEF, 2001, 2004).

The main goals are to reduce energy demand and greenhouse gas emissions, to create local expertise to fund further energy efficiency projects and to act as role model for other initiatives (IFC, 2002). Energy efficiency investments are, for many countries, a relatively novel area. For relatively energy intensive countries, improving energy efficiency frees up additional resources for growth and reduces the cost for

firms in an environment of increasing energy prices. In addition, it reduces the amount of greenhouse gas emissions. The HEECPs pursue these main goals and build expertise and a role model for other initiatives to encourage further investment and to create functioning markets that need no further incentives to provide sufficient capital for energy efficiency projects (GEF, 2004).

Energy efficiency investments face financial barriers and credit guarantees of the HEECPs can be one of financial instruments to overcome these. The barriers in Hungary include weak credit and inexperience with the credit profiles of large energy users, cautious lending practices especially towards SMEs and a lack of expertise and capacity of local financial institutions to handle energy efficiency financing and the resulting high transaction costs (GEF, 2001). Most of these barriers are similar in the Jordanian context (Saadani, Arvai & Rocha, 2010).

Operating procedures and products

The principal offerings are credit guarantees, which are an insurance against the default of debtors. The guarantees offer a certain amount of financial protection, often express as a percentage of the loan value, for the credit issuer. This can decrease the gap between the perceived and actual credit risk and hence lower the cost of capital or enable a longer loan tenor or grace periods (European Commission, 2010).

Credit guarantees are used as a first-loss reserve, meaning these will only be repaid after all other outstanding credit has been recovered. In the HEECP, credit guarantees are provided for up to 35 per cent of value. Financial institutions therefore have a guarantee that 35 per cent of the loan value will be paid in a case of a default (GEF, 2001, 2004). This reduces the perceived risk of these loans and results in favourable loan conditions and therefore to an increase in the potential loan numbers and volumes (European Commission, 2010). The HEECP and HEECP2 credit guarantees were subordinate to other claims, meaning they would be repaid last. After the initial success of these programmes, thee HEECP2 extension to include the CEEF project increases the value of loan guarantees to 50 per cent but puts it on an equal footing with other debts (GEF, 2004).

The funding dedicated to credit guarantees is leveraged to encourage further investment. The credit guarantees as well as the provision of training for financial institutions is used to leverage the total amount of available funding. The purpose of the guarantees is to enable local co-financing and increase the total available lending pool by a multiple of the initial credit guarantees (European Commission, 2010; GEF, 2001).

Educating financial institutions about financing energy efficiency projects is another method to reduce perceived risk and encourage investment. HEECP aims to training financial institutions in deal structuring and related skills (IFC, 2002). Local financial institutions lack the necessary skills and experience to evaluate energy efficiency projects and the credit of energy intensive companies and SMEs.

In addition to training financial institutions, HEECP also provides training to Energy Service Companies (ESCOs) and SMEs in the energy efficiency sector. This method ensures that the increased expertise of the financial sector with energy efficiency projects is matched by an increase in the number and quality of funding applications and to encourage further equity investment into ESCOs and energy efficiency businesses (GEF, 2001).

Results

The initial HEECP pilot project is successful and encouraged the introduction of its descendant, HEECP2 and later on the incorporation of the CEEF project. IFC and GEF build on successive projects to encourage energy efficiency as seen in Table 8. The HEECP introduced credit guarantees for energy efficiency projects and the uptake by financial institutions in Hungary resulted in a large increase of the number and value of projects and substantial emissions reductions (GEF, 2004).

Similar credit guarantee schemes have been introduced in nine other countries, demonstrating the portability of these instruments. IFC and GEF collaborate with financial institutions in Hungary to establish the HEECP. The success of this approach led to an expansion into other countries. Part of the expansion is facilitated by the fact that financial institutions participating in the Hungarian HEECP are active in other countries. Nevertheless, collaboration with new participants is possible and often necessary (GEF, 2004).

Table 8: Establishing a large and operational credit guarantee scheme may require time and pilot projects

Scheme		International co-financing ($US million)	Local co-financing ($US million)
HEECP	1997-2001	4	20
HEECP2	2001-2004	16.25	76.55
HEECP2 and Commercialising Energy	2004-2008	8-15	30-80

Source: Vivid Economics based on (GEF, 2001; IFC, 2002; European Commission, 2010)

Lessons and implications for Jordan

Credit guarantees can be an efficient way of overcoming barriers to energy efficiency investment and can be used to leverage investment, resulting in a smaller initial capital requirement. The success of the HEECP and HEECP2 as well as the expansion of the programme to other countries demonstrates the ability of credit guarantees to efficiently encourage energy efficiency projects. In the case of Hungary, each amount of credit guarantees resulted in a fourfold increase in energy efficiency project funding (GEF, 2001, 2004). Relatively small credit guarantees can therefore be leveraged to encourage large investments. This is particularly useful in the Jordanian context as funding can be increased without straining public finances or acquiring large amounts from international donors.

However, credit guarantees have to be complemented with other financial instruments and are not an effective instrument to overcome insufficient equity on the debtors' side. Credit guarantees are not able to inject additional liquidity and are therefore not able to mitigate a lack of liquidity in credit markets. Additional measures are needed to complement credit guarantees to encourage energy efficiency investment in illiquid markets. Furthermore, if certain energy efficiency projects require a significant capital investment, the equity level of especially SMEs may not be sufficient to meet minimum requirements. In these cases, additional debt or equity needs to be provided to these companies to enable credit guarantees to work (European Commission, 2010; GEF, 2004; Saadani et al., 2010).

Training and supporting financial institutions as well as ESCOs and SMEs engaging in energy efficiency projects is necessary to foster expertise and increase the number and value of successful funding applications. One of the main reasons for the establishment of the HEECPs is the lack of expertise and capacity in local financial institutions as well as unknown credit profiles for energy intensive companies and SMEs. To be successful, the HEECP and HEECP2 actively engaged with financial institutions to aid the deal structuring and to provide sectoral expertise (GEF, 2001, 2004). In addition, ESCOs and SMEs are supported in funding applications and potential ways to increase equity investments.

Continued improvement in loan recovery rates and times might be needed for the success of a credit guarantee scheme or the guarantees need to be extended to cover a larger percentage of the loan value compared with Hungary. Jordan currently ranks below Hungary and other countries in which a schemes based on the HEECP has been implemented to date. Loan recovery rates are more than ten percentage points below Hungary and it takes up to four and quarter years to recover, whereas the average time for Hungary and other countries is as low as one and half to two years as shown in Table 9. In addition, neighbouring and selected North African countries rank similar to Hungary.

Table 9: Loan recovery rates and times are important characteristics for credit guarantees and countries with credit guarantee schemes are better positioned than Jordan.

Group	Country	Loan recovery rate (per cent)	Loan recovery time (years)
Benchmark	Hungary	38.4	2
	Extension countries*	38.5-59.8	1.5-4
Middle East and North	Jordan	27.4	4.3

Africa	Morocco	35.1	1.8
	Tunisia	52.3	1.3
	Saudi Arabia	37.5	1.5
Developed countries	Canada	88.7	0.8
	United States	76.7	1.5
	Netherlands	82.7	1.1

** This includes the range present in countries having schemes based on the HEECP: Czech Republic, Estonia, Latvia, Lithuania and Slovakia.*

Source: Vivid Economics based on World Bank (2012) and Saadani, Arvai and Rocha (2010)

6.4. Eco-Cities of the Mediterranean

The third case study examines the Eco-Cities of the Mediterranean initiative, established by the Ministry of Environment in Jordan and the United Nations Industrial Development Organisation (UNIDO), and intended to support sustainable urban development through a wide coalition of actors, sectors and policies. As a microcosm of broader efforts to promote a green economy, it acts as an example of the importance of a comprehensive approach to establishing a green economy, and of the importance of good policy and institutions in attracting green finance.

Background and design

Just over half the world's population currently lives in cities and by 2030 the proportion will have risen to 60 per cent (World Health Organisation, 2012). Roughly 80 per cent of natural resources are consumed in cities, and by 2030 they are expected to account for circa 70 per cent of global energy demand and greenhouse gas emissions. The population of the MENA region is predicted to rise to 430 million by 2030, of whom 280 million will be urban dwellers (World Bank 2008). A growing urban population places ever greater stress on the region's natural resources and on the ability of local governments and municipalities to provide adequate urban infrastructure and services.

Eco-Cities of the Mediterranean is intended to protect the scarce and/or fragile natural resources of the Mediterranean (the Middle East and North Africa in particular) by looking at cities – notably by improving cities' economic performance whilst minimising negative environment impacts, and by facilitating the transition to sustainability. It focuses on sectors relevant to urban development such as sustainable transport, waste management, air pollution, green building, clean energy and energy efficiency, and water use and conservation. In this effort it brings together governments, international aid organisations, NGOs, community-based organisations, academia and the private sector to develop solutions to the challenges facing the Mediterranean's cities.

Originally launched in 2007, a first international forum was held in Amman in 2008 and a second in Marseilles in 2011. The 2008 forum led to the Amman Declaration, which calls upon local government, municipalities, media, the private sector and financial institutions to take a proactive and inclusive approach to sustainable urban development. It also aims to raise awareness and to create a platform for sharing and advancing knowledge.

At the Forum in Marseilles Jordan's Ministry of Environment and other organisations laid out **the principles necessary to encourage sustainable urban development** (UNIDO, 2011). They are:

- Forward-thinking and inclusive green urban policy and planning at a national, regional and municipal level;
- Institutional strengthening and capacity building of local governments and municipalities, especially in areas of urban planning and development across relevant sectors;
- Successful partnership between local government, municipalities, business and civil society;

- » Funds mobilisation from a variety of sources including national, regional and local government, municipalities, development agencies, and the financial sector;
- » Financial instruments (e.g. fiscal incentives and concessional finance) to promote investment, with a focus on commercial banks;
- » Development and promotion of production capacity of, and domestic and export markets for, green goods and services;
- » R&D and knowledge creation in green sectors (in collaboration with industry and academia);
- » Synergies between cities across the Mediterranean region.

Jordan has taken a lead in embodying these principles in drafting the Amman Green Growth Programme. The programme covers four sectors: municipal waste disposal (both solid and water waste), urban transport, sustainable energy and urban forestry. It will require total investment of $2.82 billion over a 28 year period and is predicted to reduce GHG emissions by 0.56 million tonnes of CO_2 equivalent per year. Amman is also home to the first city-wide CDM project in collaboration with the World Bank's Carbon Partnership Facility, and has established a green building programme.

The Eco-Cities initiative is also being supported by a collection of international organisations; details of two such programmes are presented in the text box below.

Box 1: Initiatives in support of Eco-Cities of the Mediterranean

The World Bank's "Eco2 Cities – Ecological Cities and Economic Cities" programme offers an integrated, cross-sectoral approach to promoting urban low-carbon development and resource efficiency (World Bank, 2011). Principles of Eco2 Cities are: a city-based approach led by local governments and contexts; collaborative decision-making between all stakeholders and the alignment of actions with incentives; integrated urban planning across urban sectors; and an investment framework that takes into account the value of all urban assets, including natural resources. The programme is being implemented in China, Vietnam, Indonesia and the Philippines, amongst other places.

The EIB has a focus on urban development under the "Facility for Euro-Mediterranean Investment and Partnership (FEMIP)", the EIB's overarching programme for support to the Mediterranean area that aims to provide assistance to the private sector and create an investment friendly environment (EIB, 2011). In an urban context, the EIB's strategy is based upon four concepts: urban investments have to concentrate on increases in and improvements to government services; urban planning must be inclusive of all stakeholders; green spaces in cities must be maintained; and assistance should be provided to local governments and municipalities to develop green urban development plans. FEMIP thus focuses on waste water management and treatment, urban transport schemes, social housing rehabilitation and improvement (including building certification), and technical assistance to authorities in green urban planning. It also encourages knowledge transfer and research and development (R&D).

Source: World Bank and EIB

Lessons for Jordan

Eco-Cities of the Mediterranean can be taken as a microcosm of Jordan's larger effort to establish a green economy and as such a number of lessons can be drawn from it. These lessons relate to the broader green economy enabling environment and correspond in large part to the recommendations made in Section 7 of this report. All of them are relevant to Jordan's desire to scale up green investment, in that they are prerequisites for attracting finance into the green economy. They more they are taken on board, the greater investor interest and confidence will be and the higher the amount of capital that will be invested.

- » **Eco-Cities takes a holistic approach to urban development,** notably incorporating sound policy development and planning, the mobilisation of financial resources from all funding sources – including the financial sector, and the promotion of knowledge sharing and R&D.
- » **Robust and long-term policy and planning is the foundation of sustainable urban development,** and must be inclusive of all stakeholders. Government at all levels needs to demonstrate it is committed to

policy goals to effectively scale up investment. Public-private coordination and dialogue during and after the policy drafting process is important to ensure effective policy implementation.

- **The harmonisation of urban planning across sectors and between levels of government is mandatory for effective implementation and to attract investors.** Efforts to promote green activities in one sector must not conflict with efforts in another sector and ideally would tally with them. For example, national-level incentives for urban home construction should be consistent with local government plans to preserve green public spaces.
- **The successful roll-out of programmes derived from the Eco-Cities initiative depends on the institutional capacity of the public authorities involved in green urban planning and development,** including the relationship between various arms of government at different levels and with different spheres of influence. Better institutional capacity and coordination will instil greater confidence in investors.

7. Non-financing recommendations

Improving access to finance for green economy projects is only one important aspect of moving towards a green economy. The discussion in Section 4 centred on the idea that financing barriers represent only part of the challenge when it comes to promoting the green economy and that policy and institutional changes are also required. These, in turn, will help smooth access to finance for businesses in the green economy. This point was reiterated in a series of roundtable discussions with financiers and firms in Jordan with an interest in the green economy.

This section suggests a complementary set of initiatives to support Jordan's green economy development. Although this is not the key focus of this report, both international experience and discussions with Jordanian stakeholders emphasised the importance of overcoming non-financing barriers as a set of crucial complementary steps that will need to be adopted. This section is divided into two elements:

- Section 7.1 provides some institutional recommendations; and
- Section 7.2 identifies some broad policy recommendations.

Both sub-sections draw upon both the team's understanding of the Jordanian context and international experience and best practice.

7.1. Institutional recommendations

Create a unit within an influential 'convening' part of government to coordinate government action and provide political leadership on green economy issues

There is a challenge in ensuring policy continuity and coordination that may inhibit green investment. One of the key barriers holding back the green economy is the lack of continuity between successive administrations and lack of co-ordination across government departments. This is illustrated by the fact that since December 2009 there have been five changes in government. This generates uncertainty for potential investors in the green economy (which is often characterised by long-lived assets) as they lack confidence that policies will be maintained from one government to the next. Additionally, there is concern about the level of political will behind the creation of a green economy in Jordan, as well as about the extent and nature of policies and strategies in place. The still widespread deployment of fossil fuel energy and water subsidy programmes, notwithstanding recent changes, as well as the perception that nuclear energy is given greater attention and funds than green energy, are evidence of this. This is not unique to Jordan since similar challenges have been present in other countries. Yet, as identified in Section 2, the benefits from the transition to a green economy are particularly clear in the case of Jordan.

This issue may be partly addressed through the establishment of a dedicated inter-departmental team focussed on green growth planning. In order to overcome these transitional barriers, an independent committee could be introduced to oversee the implementation and coordination of Jordan's Green Economy Strategy – including green finance – as follows:

- A committee, headed perhaps by the Minister of Planning and International Cooperation, could be formed through a decision made by the Council of Ministers, with the mandate to approve 'Jordan's Green Economy Strategy', oversee its implementation and ensure its coordination while avoiding duplication.
- The committee might include the following entities:
  - Ministry of Energy and Mineral Resources;
  - Ministry of Industry and Trade;
  - Ministry of Environment;
  - Ministry of Finance;
  - Jordan Investment Commission;
  - Jordan Enterprise Development Corporation;
  - Jordan Central Bank;

- Business associations such as the Association of Banks in Jordan, the Jordan Green Building Council and EDAMA.

- This committee could be supported by a special unit linked directly to the Minister of Planning and International Cooperation to provide administrative and logistical support.

The body would need to be given a clear mandate and terms of reference to ensure focus and political support. In order to ensure that any resulting analysis, recommendations and actions brought about by such a body would have sufficient political clout, it would be necessary to establish its precise role and mandate in the first instance, and to have this agreed upon at the most senior levels of government.

This would build on institutional developments in other countries pioneering green growth. For instance, in Korea, a Presidential Committee on Green Growth (PCGG) was established by statute, under the direct supervision of the President. The PCGG has the overall responsibility of implementing and managing the government's efforts to participate in the green economy. This consists of members of both the public and private sector, with a majority of non-governmental members, and is supported by its own secretariat (GGGI, 2011).

Establish a platform for dialogue between the public and private sector (including the financial sector)

At present, there is a limited dialogue between the public and private sectors in relation to Jordan's green economy policy objectives and instruments. This has led to an environment in which there is limited understanding between different parties, which allows in turn for mutual mistrust to develop. For instance, many representatives from the private sector (both financial institutions and potential project developers) did not feel engaged by the process through which the JREEEF was established.

A similar challenge has been noted in relation to broader economic policy decisions. For instance, the World Bank's Country Partnership Strategy for Jordan notes that "for private sector and banking sector representatives a key problem was the absence of dialogue between the public and private sectors to produce viable solutions to economic and financial problems".

The Government of Jordanian could consider developing a platform through which different stakeholders with an interest in the green economy could meet on a regular basis to discuss key policy initiatives and provide feedback on the activities being undertaken. The intention would be to provide an opportunity for regular dialogue so as promote greater understanding of the respective views of different stakeholders.

There are a number of international precedents on public-private partnerships to support the green economy on which this reform might be based. For instance, the Clean Energy Ministerial (CEM) – a gathering of 23 leading economies which convenes to discuss the low-carbon transition – has, since the third CEM in 2012, been augmented by a series of public-private roundtables organised by the World Economic Forum. The report accompanying the third CEM concludes that (World Economic Forum, 2012):

"The roundtables increased the private sector's understanding of how government view their own priorities in scaling up clean energy. They enabled policy-makers and business to discuss policy and regulatory strategies that can increase corporate investments in clean energy. Participants identified key areas in which public-private initiatives and partnerships can be used to address market and implementation barriers to further the agenda. The discussions resulted in a number of recommendations that are now being incorporated into the CEM process and into individual technology initiative."

The same approach has also been successfully used across different sectors of the economy in various countries. There are examples of similar partnerships in countries as diverse as Vietnam, Botswana, Turkey, Senegal, Malaysia and Germany which have helped to address a wide range of investment climate issues such as licensing and approvals, public procurement and foreign direct investment. A World Bank paper reviewing this experience, while noting that a smart design is required to deliver results, claims that the dialogues created by these institutions can "clarify the incentive and build the capacity of governments to implement reforms … reveal to governments the likely micro-economic foundations for growth … [and] create a sense of local ownership which makes policies more likely to succeed in practice" (Herzberg and Wright, undated).

There would be scope for combining an inter-departmental green growth team and a public-private dialogue platform. For example, one of the key roles for the proposed inter-departmental team would be to organise and facilitate public-private dialogue on green growth issues.

7.2. Policy recommendations

Reduce subsidies and replace them with targeted interventions specifically aimed at helping the worst off households

The current system of energy and water subsidies both causes both macroeconomic challenges and represents one of the biggest barriers to the growth of green economy. As documented previously, the current practice of below-cost pricing for energy and water is imposing considerable macroeconomic strain. In the case of the water sector, the situation will be exacerbated by new investments: the Disi Pipeline alone is expected to increase the deficit by JD 175 million. These subsidies make it more difficult to justify interventions that reduce water and energy consumption and, in the case of renewable electricity, impede the development of technologies that are in fact cost competitive.

The recent changes in the subsidy regime will make a significant difference and should not affect the least worst off families. The new subsidy system is expected to reduce the cost on the Treasury from nearly JD 800 million to between JD 270 and 300 million. At the same time, in order to avoid affecting the poor, individuals in household consists of six members or less whose income is less than JD 800 a month or JD 10,000 a year will receive JD 70 in compensation.

But further changes are required while continuing to ensure that the least well-off families are supported. A particularly clear area for focus may be the water sector, where despite a long-term political commitment to move prices towards cost recovery levels, there has been little progress in recent years. Likewise, the recent change in the subsidy regime has not touched power prices.

Changes in water prices are relatively easy to put into effect administratively. The Council of Ministers has the right to change the water tariff based on a request from the Minster of Water and Irrigation.

Where existing regulations exist, improve their enforcement

The Ministry of Environment has adopted a stick and carrot approach towards achieving environmental stewardship. This means that compliers are rewarded while violators are punished. For instance, the approach underpinning the Jordan Environment Fund (as discussed in section 2) is that violators pay fines and fees that are handed over to companies and programs that support environmental improvement. Such principles should ensure that any short-term costs to the economy created by improved environmental performance are minimised (Stavins, 2001). In addition, ensuring higher levels of compliance with environmental regulations through enforcement helps create a marketplace for products and service that aim to improve Jordan's environmental performance.

Legal responsibility for the enforcement of the existing regulations rests with the Ministry of Environment. Rangers are responsible for enforcing all laws relevant to the environment including laws in environmental protection, waste management, agriculture, health and municipalities. The Ministry is working to implement capacity-building programmes to strengthen processes and ensure consistency in the inspection and enforcement of environmental laws.

Action and resources to improve enforcement standards may be required. Limitations in resources in comparison to the amount of enforcement required have resulted in relatively weak enforcement levels. Additionally, the lack of clear standards and testing capabilities has resulted in high levels of ambiguity. Increasing the size and capability of the Rangers, in addition to developing clear standards (if and when required), and ensuring full collaboration between different government departments, should increase enforcement levels. This need for such a response was recognised in a survey of financial institutions in Jordan carried out in October 2012.

Support R&D in the green economy

A global transition to a green economy creates the potential for new market and export opportunities for Jordan. As discussed in Section 2, it is becoming increasingly acknowledged that a global transition towards greener economies has the potential to radically alter patterns of production and trade. Well-prepared countries may be able to benefit from an increase in export earnings from these shifts. For instance, Fankhauser et al. (2012) find that the future "winners of the green race" may be very different from those currently dominating export markets.

Jordan is in a strong position to be at the forefront of these developments in the MENA region and beyond. Jordan's young, well-educated labour force places it in a strong position to benefit from such shifts. Furthermore, the Royal Science Society (RSS) and Jordanian universities have placed a particular

focus on energy and water efficiency to both help boost industry and to contribute to provide green jobs for the younger generation. In this respect, the RSS is working on the following in relation to the application of green technology:

- **Energy:** developing new renewable energy resources from solar, hydrogen and bio-fuels.
- **Water:** devising and advising various partners on efficient water use, wastewater and grey water re-use, indoor air quality and cleaner production.
- **Environment:** supporting relevant ministries in the provision of policy advice with respect to environmental impact assessments, monitoring and evaluation of water and air quality, and contributing to the Clean Development Mechanism as part of climate change mitigation and adaptation.

The University of Jordan has also launched a centre specialized in water and energy. These efforts, coupled with several other national programs aimed at encouraging home-grown, knowledge-based entrepreneurship, such as the Queen Rania Centre for Entrepreneurship and Oasis 500, can help create a green economy SME ecosystem.

In total, Jordan has ten public universities and 17 private universities, in addition to the World Islamic Sciences and Education University (Ministry of Higher Education, 2012). Together these institutions employed over 7,000 faculty members in 2008 (Directorate of Information Technology, 2009). Close to 16,000 scientists and engineers work in scientific and technological fields in the public and private sectors. Nevertheless, in 2008 expenditure on R&D in Jordan did not exceed 0.42% (UNESCO, 2008).

This could be attributed to a several reasons. These include:

- The brain drain: the R&D sector in Jordan has not been able to retain many academics and researchers who have left to teach in GCC or western countries. For example, during the academic year 2004-2005 16,947 Jordanians were pursuing higher education abroad, including 1,025 PhD students, not all of whom will return to the country. And even if they do, they will not, most probably, find the adequate legal and physical infrastructure that would enable them to conduct the same kind of research as abroad.
- Immigration and residency laws and regulations: there is a perception that immigration and residency laws and regulations may impede foreigners wishing to undertake research in Jordan.
- Incentive schemes: one of the reasons for which corporations and individuals do not invest time, effort and money in R&D may be the lack of comprehensive incentive schemes.
- Access to markets: it is becoming more difficult for Jordanians to travel to western countries for business, joint research or education.
- Inadequate linkages between industry and academia.

To address these challenges, there are a number of steps that the Jordanian government could undertake. These include:

- Carry out a study to examine what would be the most effective form of policy support or incentives for research and development in the green economy taking account of the Jordanian context and international best practice. This might include support for business incubators for green businesses, e.g. in renewable energy.
- Design and implement a harmonized National Innovation Strategy, which is the base for all currently on-going and planned innovation support measures (JEDCO, 2009), including a including a clear intellectual property policy.
- Restructure and empower the R&D Fund at the Ministry of Higher Education while giving higher priority to green research
- Review immigration and residency laws to see whether there are opportunities to make it easier for highly-skilled migrants to work and live in Jordan.

Improve the collection of environmental and green growth statistics

Accurate date is a prerequisite for measuring the effectiveness of Jordan's shift towards a green economy. If it is not possible to accurately measure performance then it will not be possible to assess whether or not progress is being made, and hence whether or not it is necessary to modify policies or approaches.

A green growth strategy requires more and different data to that traditionally collected by statistical agencies. GDP as a sole measure of progress, although in widespread use, is notoriously flawed. A wider range of statistics that, in particular, value and track the wealth of all assets in the economy (both conventional assets, as well as human and natural capital) is needed to complement the traditional focus. In particular, such measures can provide an insight into the overall wealth of a country, measured by its total stock of assets, that is missed by a sole focus on GDP and similar statistics, which only capture the flow of income in any one year. Only with both a stock and a flow measure is it possible to see whether increases in income are being driven by unsustainable depletion of a country's assets (wealth).

The Environmental Statistics Division in the Government of Jordan's Department of Statistics was established in 1995 to becoming a reliable national benchmark for high-quality environmental statistics. Its activities cover most environmental issues and are reported on an annual basis. It is intended to integrate environmental considerations within the economy by establishing environmental accountability and by informing policy about the current environmental situation. It is also intended to monitor the outcome of policies. It plans in the future to improve data collection and dissemination, to expand the range of environment and green economy indicators, and to further support the decision-making process. It is hampered, however, by doubts over the reliability of information, conflicting information, and a lack of cooperation and coordination between a variety of public and other institutions. It is also faced with the challenge of feeding information into the policymaking process.

A variety of international efforts are underway to improve the collection of statistics to provide a more comprehensive assessment of a country's performance. These include the World Bank's and partners' WAVES project, the UN Inclusive Wealth Report as well as the now-concluded Commission on the Measurement of Economic Performance and Social Progress, chaired by Joseph Stiglitz. Such initiatives are highlighting the importance of measuring the value of natural assets and associated aspects of green economic performance, and provide practical recommendations of how this data can be augmented within existing national statistics regimes.

Jordan needs to strengthen the activities and capabilities of the Environmental Statistics Division in the Department of Statistics, overcoming the barriers identified, and to take advantage of the growth in global knowledge about how to collect statistics on environmental performance.

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