

ECONOMIC AND SOCIAL COMMISSION FOR WESTERN ASIA (ESCWA)

**MONITORING THE TRANSITION TO A GREEN ECONOMY IN THE
ARAB REGION: THE SME PERSPECTIVE**

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ABBREVIATIONS AND ACRONYMS

CAMRE	Council of Arab Ministers Responsible for the Environment
EGS	Environmental goods and services
ESCAP	Economic and Social Commission for Asia and the Pacific
ESCWA	Economic and Social Commission for Western Asia
GCC	Gulf Cooperation Council
GDP	Gross domestic product
ILO	International Labour Organisation
ISO	International Organization for Standardization
MDGs	Millennium Development Goals
MENA	Middle East and North Africa
MW	Megawatt
NGO	Non-governmental organization
OECD	Organisation for Economic Co-operation and Development
Rio+20	United Nations Conference on Sustainable Development
SME	Small and medium enterprises
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
UNSD	United Nations Statistics Division

Executive summary

This study assesses progress in the Arab region towards the green economy. It reviews the adoption and implementation of policies to support the transition and examines the achievements of different sectors. The study identifies challenges and highlights potential opportunities for countries to green their economies. Given their vital economic role, the study focuses on the transition of small and medium enterprises (SMEs) to greener processes, products and services. A bottom-up approach to the topic involved interviewing entrepreneurs, learning from their stories and gathering key information from them on the main challenges they must overcome and the drivers that could aid the transition.

The study sets the conceptual background by providing definitions for key concepts that are discussed in the report: green economy, SMEs and “green SMEs”. It explains the importance of SMEs in the region, as well as the role of indicators for effective monitoring.

The study presents a series of indicators and statistical tools to help Governments and enterprises monitor progress towards green economy in the Arab region. Monitoring the transition to the green economy will have to focus on different levels. The review of indicators is therefore based on three categories: (i) macro indicators for monitoring sustainable development; (ii) meso indicators for monitoring green economy and green growth; and (iii) micro indicators for monitoring SME performance. By using different indicators and statistical tools and adapting them or sometimes combining them, it is possible to create an accurate view of the transition towards a green economy in the Arab region.

The status of the green economy in the Arab region is a key focus area of the study. It provides success stories, experiences, programmes and policies that have been implemented in the various sectors in the region.

Through a thorough desk review of various references, the study explores indications or signs of the transition in the Arab region, focusing on green economy characteristics including applications and experiences. The study presents drivers of the green economy at the national and international level that originate from the public and private sectors. To successfully transition to the green economy, Governments in the region must assess trade-offs and promote green finance and technology transfer. The study suggests indicators to monitor the transition to the green economy that are appropriate to specific sectors.

The study identifies the characteristics of Arab SMEs and their role in sustainable development. It explores the potential of SMEs to contribute to the transition towards green, low carbon economies by ‘growing the green’ through strengthening emerging green sectors and seizing opportunities in eco-innovation and new market creation. It shares examples of SME opportunities in the manufacture of environmental goods or the provision of services. Enterprises can also participate in the green economy by ‘greening the brown’ by reducing the environmental impact of so-called brown sectors, characterized by pollution, waste and inefficiency. The study also presents challenges for green SMEs in the Arab region at the macro and micro levels.

Finally, the study presents many policy tools and practical measures to support the transition to the green economy, improve monitoring and strengthen green SMEs. Governments can trigger the transformation through a number of policies, particularly by incentivizing private finance for green enterprises. Measures should reflect national circumstances, but for most countries in the Arab region, priority areas will include agriculture, water, energy, transport and construction. To overcome the significant challenges that remain, Governments must improve monitoring and institutional capacity.

Introduction

In June 2012 world leaders met again on Rio de Janeiro, Brazil for the United Nations Conference on Sustainable Development (Rio+20), to follow up on the international framework for sustainable development through the Rio Declaration on Environment and Development, Agenda 21 and associated treaties.

There is no doubt that Rio+20 took place during challenging political and economic times. As with the original conference in 1992, there are differing perspectives on whether Rio+20 was a success or a failure along with differing expectations of what is possible during these difficult times.

The two main themes for Rio+20 were a green economy in the context of sustainable development and poverty eradication, and the institutional framework for sustainable development, both of which were debated in detail during the negotiation of the outcome document entitled *The future we want*. The adoption of the concept as one of the two themes for Rio+20 stimulated a great deal of debate and international attention with a number of international organisations publishing reports that further elaborated on the concept. Despite international attention, it is still a relatively new concept in the Arab region, and green economy initiatives and related statistics are in short supply.

Negotiations on the green economy leading up to Rio+20 were challenging, and many developing countries raised concerns regarding trade protectionism, conditionalities on aid and finance, a one-size-fits-all application of the concept and the need for greater focus on poverty eradication and social goals. A positive outcome of Rio+20 has been that the international community has refined the definition of the green economy to make it more balanced, flexible and effective, and less vulnerable to those concerns and risks.

The new interpretation of the green economy supports a bottom-up approach defined by local, national and regional needs and priorities rather than a top-down economic model. In that way, the concept has been regionalized to embrace different national circumstances, economic systems, geographical locations, policy options and priorities. Thus, there is no single interpretation of the green economy, but rather various green economies.

That is important, because the Arab region is characterized by asymmetrical economic development, environmental circumstances and strategic priorities. A broader characterization of the green economy is therefore important when analysing progress and monitoring relevant policies, decisions or programmes.

This study reflects the progress of the Arab region in adopting and implementing green economy policies and the achievements in different sectors. It identifies various challenges and highlight potential opportunities for countries in the region to green their economies. While highlighting the specificities of the region, the study presents indicators to monitor the transition towards a green economy and focuses on small and medium enterprises (SMEs) given that they are a substantial economic force. This study is offered as a policy tool for Arab Governments to monitor green activities. It outlines a range of green economy policy options for Governments, including options for supporting green SMEs and ways to enhance their capacity to monitor the transition to the green economy.

In most Arab countries, SMEs play a key role in national economies. They provide employment, contribute to gross domestic product (GDP), and constitute a significant percentage of the private sector. Thus, SMEs were selected as the main focus of the study. To investigate the transition towards a green economy in the region, the study analyses the extent to which SMEs are greening their business, engaging in the production of green goods and services and becoming protagonists of a green revolution. Although the contribution of SMEs to national economies varies across the region, and may be relatively small in some Gulf Cooperation Council (GCC) countries, SMEs can still provide a useful indication of the transition taking place in the region.

The study presents a set of indicators to help Governments and enterprises monitor the transition to a green economy at the macro and micro level. The indicators are based on those developed by a number of international organizations, including green growth and green economy indicators and monitoring tools developed by OECD and UNEP. Complemented by international and regional efforts to identify indicators for sustainable development, those tools can help assess the role of social and environmental improvements in economic growth. For example, OECD green growth indicators can be adapted to focus on SMEs and can be combined with the United Nations Industrial Development Organization (UNIDO) Resource Efficient and Cleaner Production (RECP) indicators to monitor how individual companies are performing in the framework of green growth that is environmentally and socially friendly. Governments in the region are also tracking data that feed into national environmental accounts, in particular in the water and energy sectors. Those data can be used to monitor use and misuse by SMEs or by the whole economic system.

This report asserts that it is possible to present a picture of the transition towards a green economy by using indicators and statistical tools, adapting or combining them as needed. Nevertheless, despite significant improvements, monitoring the transition to green economy particularly in the Arab region is still hampered by inadequate infrastructure and insufficient resources, especially in designing and conducting specialized surveys in the fields of environment, water and energy. Therefore, the study will also outline policy recommendations to assist Arab countries in monitoring the transition and achieving green growth.

To provide better guidance to Arab Governments on the way forward, this report features a desk review of well-designed indicators, which focuses on the macro, meso and micro levels. It explains indicators that have been developed under the leadership of the United Nations and other international organizations, particularly OECD. In addition, interviews were conducted with entrepreneurs in Lebanon, Kuwait, Oman and Egypt to gather key information on the main challenges they face and the options that could assist them.

Although there is a great deal of information available at the global level, there is limited information and data available at the regional level. This report seeks to adapt the global understanding of the green economy to the specificities of the Arab region while maintaining a sound analysis.

I. CONCEPTUAL BACKGROUND

A. DEFINITION OF TERMS

1. *Green economy and green growth*

The green economy has been at the centre of policy debates in recent years. The “green economy in the context of sustainable development and poverty eradication” carries the promise of a new economic growth paradigm that is environmentally friendly while also contributing to poverty alleviation. This has resulted in a rapidly expanding literature and emerging international practice focusing on the green economy and other related concepts such as green growth. Recently, the United Nations Department of Economic and Social Affairs published a guidebook to the green economy that identified at least eight different definitions of the term and 13 definitions of green growth. Some of those definitions are useful for the discussion presented in this report.

For example, according to the definition set forth by UNEP, the green economy “results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities”.¹ As defined by OECD, green growth entails “fostering economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies”.² Likewise, the Economic and Social Commission for Asia and the Pacific defined green growth as “economic progress that fosters environmentally sustainable, low-carbon and socially inclusive development”.³

In its report on the green economy, the Arab Forum for Environment and Development stated that “a fundamental tenet of a green economy is giving equal weight to economic development, social equity, and environmental sustainability”. Furthermore, “a green economy places great emphasis on the efficient use and deployment of natural assets to diversify the economy”.⁴

To achieve green economies and greener growth, OECD has recommended that countries develop new green industries, jobs and technologies. They must also develop new green activities and competencies, upgrade skills, and transform and create jobs. Countries must manage the process of greening traditional sectors and deal with its impact on employment and labour distribution, particularly the reallocation of capital and labour resources within and across sectors. Green growth implies decoupling economic and environmental performance, and to do that, countries must adopt new technologies, develop new products and support new patterns of demand from households, companies and Governments. They must invest in the environment as a driver of economic growth.⁵

While the Rio+20 outcome document does not provide an agreed definition of the green economy, it does provide guidance on the interpretation and application of the concept. For example, it acknowledges that Governments will need to consider the costs, risks, benefits and opportunities of different policy options in accordance with national capacity and circumstances. They should adopt policies that support poverty reduction, human well-being and job creation, while also driving resource and energy efficiency, technological innovation and environmental protection. Policies should be developed through an integrated decision-making process that considers the social, environmental and economic pillars of sustainable development. Policies should be inclusive and transparent, supported by effective institutions and

¹ UNEP, 2011, p. 6.

² OECD, 2011a, p. 17.

³ ESCAP, Asian Development Bank and UNEP, 2012, p. 17.

⁴ Albaza et al., 2011, p. ix.

⁵ OECD, 2010a, para 1; and OECD, 2010b, para. 3.

regulations. Thus, the green economy should be interpreted differently by different countries. Furthermore, international cooperation should also be promoted to provide capacity-building, finance and technology transfer to developing countries.

Importantly, Governments agreed that a green economy should develop in accordance with and be guided by the 27 principles of the Rio Declaration on Environment and Development, Agenda 21 and the Johannesburg Plan of Implementation, and contribute to achieving internationally agreed development goals, including the Millennium Development Goals (MDGs). In doing so they ensured that a green economy would not jeopardise the agreed principles and objectives of previous United Nations summits.

2. Small and medium enterprises

Multiple conflicting definitions of SMEs are in use at the national level. For the purposes of this study, SMEs in the Arab region will be defined according to the following criteria:

- Up to 250 employees;
- Limited contribution to the overall output in its sector;
- Simplified internal communication system that is usually informal;
- Control over business operations and decisions residing with one or two persons who are usually family members.

Businesses that meet that definition represent the majority of enterprises in the region. Those enterprises drive innovation and economic growth and have the potential to become the engine of a greener economy and green growth. In developed and high growth economies, SMEs are the lifeblood of economic development and sustainable job creation. Across OECD countries, SMEs account for approximately 99 per cent of all enterprises and two thirds of employment. They could play a similar role in the Arab region if they are provided with a good working environment.

In the Arab region, SMEs are also a major source of employment, and they have a special role in achieving a balanced transition. They have the potential to fit within the new green value chains and industrial networks, as well as in agrifood and organic agriculture applications. In addition, SMEs are strongly interlinked with the three pillars of sustainable development and have a direct impact on the well-being of individuals, the resilience of the economy and the protection of the environment.

3. Green small and medium enterprises

The aim of green growth is to preserve the environment while ensuring increased output and job creation and ultimately to reduce poverty. The production, technology and management practices of green SMEs play a vital role in achieving green growth. The Economic and Social Commission for Western Asia (ESCWA) defines green SMEs as those that adopt green processes and/or those producing green goods using green production inputs. Significantly, in both of those cases, SMEs can provide the critical mass for a green change.

B. INDICATORS FOR EFFECTIVE MONITORING

To successfully transition to green growth and green economies, policies must be founded on a good understanding of its determinants and related trade-offs or synergies. Measurability of appropriate indicators and accurate monitoring of resources is a key for countries to move towards a more sustainable growth path. Traditional measures of economic performance, particularly GDP, fail to account for the depletion of natural resources, which are just as important and relevant to present and future growth as capital and labour. Governments committed to transitioning to a green economy must measure progress according to a wider set

of indicators and targets. Such data will be an essential input to policymaking at national and local levels and in the design and implementation of green growth strategies.

Monitoring progress towards a green economy requires indicators based on internationally comparable data. The multidimensional nature of a green economy requires that indicators represent its core elements along with broader issues. Specific indicators must focus on the macro level, involving economic, social and environmental performance, and on the enterprise level, focusing on internal changes related to the green transition. This section briefly presents the main indicators and statistical tools of particular relevance, which will be analysed in chapter 2.

1. Indicators of sustainable development

The international community is formulating a set of indicators to monitor the performance of a country or a region based on the economic, social and environmental dimensions of sustainable development. Such indicators can include different aspects of development and may contribute to the formation of the new set of sustainable development goals, which are being developed as an outcome from Rio+20.

Sustainable development indicators assess the progress of a country across a wide spectrum of policies and programmes for socioeconomic development, health security, low carbon growth and natural resources protection. The formulation of sustainable development indicators for the Arab region is taking place under the leadership of the Council of Arab Ministers Responsible for the Environment (CAMRE).

The sustainable development indicators are complemented by the Environmental Sustainability Index and the Environmental Performance Index.

2. Indicators of the green economy and green growth

Shifting from the macro level of sustainable development to the meso level of the green economy and green growth, another basket of indicators has been developed internationally by UNEP and OECD. The indicators are extremely important in the present study because they focus on the transition to the green economy and assess the performance of individual countries in achieving economic growth without environmental degradation.

To monitor the transition to the green economy, UNEP proposed the use of existing indicators to measure economic transformation, resource efficiency, and progress and well-being. The indicators developed by OECD go beyond the mere measurement of economic performance associated with resource protection and assess quality of life and opportunities for employment. For that reason, this publication will expand on those indicators and see how they can be adapted to SMEs in the Arab region.

3. Indicators of green SMEs

At the enterprise level, the Sustainable Manufacturing Toolkit developed by OECD can be complemented by the UNIDO RECP indicators for monitoring resource productivity and pollution intensity. In Arab countries, SMEs can use those indicators to assess how green they are. In addition, the ISO 14001 standard can also assist enterprises in greening their operations and the number of environmentally certified companies in a country may be a good indicator of the transition to the green economy. When applied at the enterprise level, ecological footprint calculations also help to identifying the shift to green production. This report presents a series of national statistics and reports of business registries and chambers of commerce that can be used as a starting point to collect data on new green companies.

II. MONITORING AND INDICATORS

Many indicators and statistical tools can be used to monitor progress towards the green economy in the Arab region. To be effective, those measures must do the following: (i) reflect the well-being of present and future generations; (ii) reflect economic, social and environmental components, as well as their interdependencies; and (iii) provide information for policymakers involved in designing investment mechanisms and incentives. Moreover, a portfolio of indicators should measure wealth, provide information on how each country is using its productive base and account for sustainability that extends beyond national borders.

Indicators give an overview of major issues and trends that should be used in the formulation of policies at the general level. Although indicators are not intended to fully represent each issue, they can draw attention to areas where further analysis or policy interventions may be useful. Indicators are only a tool: policymakers must interpret them according to national needs and priorities. Policymakers may require other qualitative information, such as ecological, geographical, social, economic, structural and institutional data, to explain changes at the country level. The value of many indicators can be enhanced when they are associated with policy objectives or reference values including benchmarks, thresholds, baselines, objectives, targets and so on.

Monitoring the transition to the green economy must be carried out on different levels. Thus, indicators have been organized into the following three categories: (i) macro indicators for monitoring sustainable development; (ii) meso indicators for monitoring green economy and green growth; and (iii) micro indicators for monitoring SME performance.

A. MACRO: SUSTAINABLE DEVELOPMENT

Through Agenda 21, the United Nations, called on the international community to develop indicators of sustainable development. The Johannesburg Plan of Implementation reiterated the call. In 2006, the Commission on Sustainable Development, along with a group of experts from developing and developed countries and international organizations, finalized the third edition of sustainable development indicators. The list of 96 indicators are grouped into the following 14 themes:

- Poverty;
- Global economic partnership;
- Natural hazards;
- Health;
- Oceans, seas and coasts;
- Demographics;
- Economic development;
- Land;
- Freshwater;
- Governance;
- Consumption and production patterns;
- Biodiversity;
- Atmosphere;
- Education.⁶

In the region, the Arab Working Group on Environment and Sustainable Development Indicators was formed in response to the decision of CAMRE at its twentieth session in December 2008 (resolution 292). The working group includes environment experts and statisticians from Arab countries and regional

⁶ The full list of indicators is available from <http://www.un.org/esa/sustdev/natlinfo/indicators/factsheet.pdf>.

organizations. The Joint Technical Secretariat of the working group consists of the Technical Secretariat of CAMRE, the Technical Secretariat of the Committee of Statistics, UNEP Regional Office for West Asia, ESCWA, the Islamic Educational, Scientific and Cultural Organization, the Centre for Environment and Development for the Arab region and Europe and the Abu Dhabi Global Environmental Data Initiative. The mission of the Joint Technical Secretariat is the development, adoption and implementation of environment and sustainable development indicators of priority to the Arab region and the implementation of the project of the Arab Network for Environmental Information.

B. MESO: GREEN ECONOMY AND GREEN GROWTH

Progress toward the green economy can be monitored by measuring natural resource use against the output generated. The ultimate goal is to decouple production and economic growth from pollution and the use of finite natural resources. Consumer behaviour, at the level of households and Governments, is an important variable. It must be considered alongside indicators of environmental and resource productivity. In addition, green growth must be monitored at both the national/international level and the local level for two reasons: (i) the impacts of climate change will vary greatly at a local level; and (ii) the impacts of responses to climate change will be distributed differently across regions. To monitor the transition to the green economy, UNEP and OECD have developed approaches that are applicable to meso-level analysis.

1. *UNEP framework*

In cooperation with national and international agencies, UNEP has developed a framework to measure progress towards the green economy that builds on existing indicators such as national accounts and MDGs. It outlined three main areas as follows: economic transformation; resource efficiency; and progress and well-being.⁷

The first area, economic transformation, illustrates the role of the green economy in the shift from growth that results from resource-intensive and waste-generating activities that pollute the environment, to growth based on resource efficient, waste management and ecosystem-friendly activities. Indicators of economic transformation include the shift of investments to renewable energy, increased employment levels in the environmental goods and services (EGS) sectors. Monitoring the engagement of new SMEs in EGS sectors must be based on the Harmonized System. Together with the combined national environmental and trade accounts, it will shed light on the transition to the green economy. Progress in the area of economic transformation can be measured by private sector through the monitoring of investments. Statistical data of the national environmental accounts may also be useful.

The second area, resource efficiency, is another aspiration of the green economy. Indicators of resource efficiency include the use of materials, water, energy and land; the emission of hazardous substances and generation of waste; and changes to the ecosystem. Many countries are already tracking some of those indicators, particularly related to resource use and emissions. UNEP encourages the use of the United Nations System for Environmental and Economic Accounting (SEEA), to ensure the comparability of data.

The third area, progress and well-being, assesses role of the green economy in fulfilling basic human needs. Investments in green goods and services can be targeted towards improved access to clean energy, safe water and adequate sanitation for poor people. Indicators of progress and well-being include the health status of the population, education levels and social safety nets. Some of those indicators are already being tracked through MDGs, and the forthcoming sustainable development goals are expected to retain a focus on the linkages between green growth and progress and well-being.

⁷ UNEP, 2012a.

2. OECD indicators to measure green growth

In 2011, OECD selected 25 green growth indicators, which reflect the work of OECD, member and partner countries, and other international organizations (table 1). During the selection process, OECD considered the policy relevance, analytical soundness and measurability of the indicators. The indicators focus on the interaction between economic growth and environment, and they must be carefully assessed against national socioeconomic circumstances.

TABLE 1. OECD INDICATOR GROUPS AND TOPICS

Main groups	Topics
Socioeconomic context and characteristics of growth	
Economic growth, productivity and competitiveness	Economic growth and structure Productivity and trade Inflation and commodity prices
Labour markets, education and income	Labour markets Sociodemographic patterns Income and education
Environmental and resource productivity	
Carbon and energy productivity	1. Carbon dioxide productivity (demand-based, production-based) 2. Energy productivity
Resource productivity	3. Material productivity (demand-based, production-based) Non-energy materials, waste materials, nutrients 4. Water productivity
Multifactor productivity	5. Multifactor productivity reflecting environmental services
Natural asset base	
Natural resource stocks Renewable stocks	6. Aggregated natural resource use 7. Freshwater resources 8. Forest resources 9. Fish resources
Non-renewable stocks	10. Mineral resources
Biodiversity and ecosystems	11. Land resources 12. Soil resources 13. Wildlife resources
Environmental quality of life	
Environmental health and risks	14. Environmentally induced health problems and related costs 15. Exposure to natural or industrial risks and related economic losses
Environmental services and amenities	16. Access to sewage treatment and drinking water
Economic opportunities and policy responses	
Technology and innovation	17. Research and development of importance to green growth 18. Patents of importance to green growth 19. Environment related innovation
EGS	20. Production of EGS
International financial flows	21. International financial flows of importance to green growth
Prices and transfers	22. Environmentally related taxation 23. Energy pricing 24. Water pricing and cost recovery
Regulations and management approaches Training and skill development	25. <i>Indicators to be developed</i>

Source: OECD, 2011a, p. 32.

Some environmental challenges in the Arab region are directly related to the OECD indicators outlined in table 1. Indicators of environmental and resource productivity are connected to the need for efficiency in the use of water and energy, and those indicators can be used to measure the transition at the local and national levels. Indicators of the natural asset base account for freshwater, forests and wildlife. A significant indicator of environmental quality of life is access to drinking water and sanitation services. To overcome those challenges, it may be necessary to revise public policies to stimulate shifts in production, consumption, purchasing, and investment patterns. The indicators outlined in table 1 can be used at the national and local levels to identify deficiencies and monitor progress towards improved performance. Improvements in those areas will help to bring about the transition to a green economy.

In most countries, responses to climate change and other major environmental conditions must be implemented at the national level. However, some policy levers are available to local authorities, such as procurement and activities to enhance the sustainability and energy efficiency of buildings and urban environments. Local government can adopt triple bottom line reporting that accounts for the relationship between social, economic and environmental factors.

An example from Copenhagen illustrates a local initiative to apply OECD green growth indicators (figure I).

Figure I. Greater Copenhagen Green Transition Dashboard



Source: OECD, 2012, p. 18.

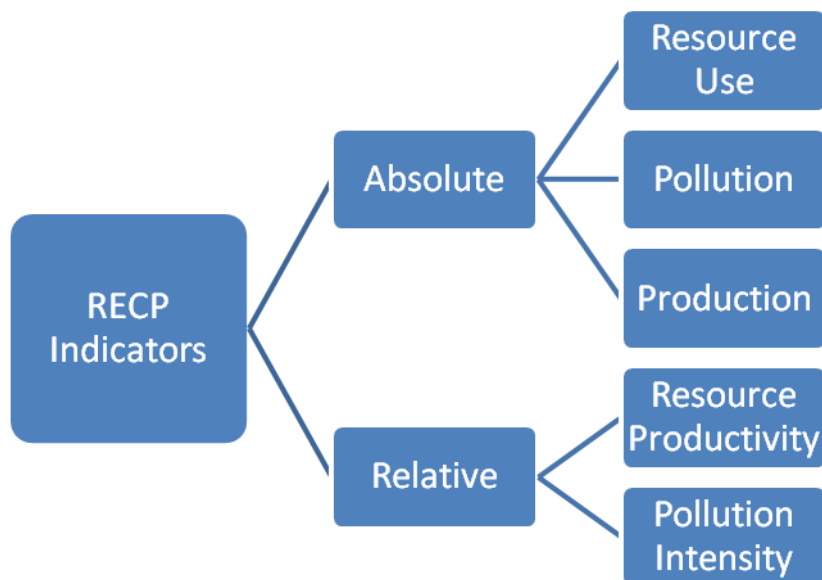
C. MICRO: SME PERFORMANCE

1. UNIDO RECP Indicators

In 2009, UNIDO and UNEP agreed on a new Joint Programme on RECP, which is a useful tool for enterprises to monitor production processes to optimize resource productivity and decrease pollution intensity. Through these indicators of performance, companies can monitor progress over time.

RECP indicators can be classified as either absolute or relative (figure II). Resource use, pollution and the weight or volume (or economic value) of produced items are categories of absolute indicators that are strongly interlinked with one another. Improvements in one area often lead to improvements in the other areas. The data gathered to measure absolute indicators are used to calculate the relative indicators in the categories of productivity and pollution intensity.

Figure II. Structure of RECP indicators



Source: UNIDO, 2010, pp. 19-21.

A successful application of the RECP programme allows an enterprise to measure the productivity of its energy, water and material use, and identify stages of the production process that could be more productive. They can then implement changes to reduce the inefficiency of that stage. Likewise, RECP exposes the pollution intensity of each step of the production process, which allows decision makers to target changes to the steps of production that generate the most pollution.

2. OECD Sustainable Manufacturing Toolkit

The Sustainable Manufacturing Toolkit, developed by OECD, contains internationally applicable indicators to measure the environmental performance of manufacturing facilities. The 18 indicators that compose the monitoring tool were developed based on the relationship between manufacturing and the environment throughout the lifecycle of products. The indicators enable firms to track progress over time and emphasize the minimization of environmental impact in the sourcing of inputs and their transformation into outputs and the creation of value from more sustainable environmental practices and products. Importantly, firms can select indicators depending on their priorities, data availability and monitoring capabilities. The flexibility of the Toolkit enables it to reflect evolving business priorities and externalities. Use of the Toolkit at the sectoral level may help a firm to assess its performance against a benchmark.

To use the Toolkit, firms should begin by mapping their priorities and identifying relevant areas and the type of data that should be collected to improve environmental performance. That information will feed into the selection and normalization of indicators. Normalization refers to the ratio of consumed resources to output. The factor that is used to normalise performance may vary from the number of products, value added or person-hours, depending on the specific context, operation and objectives of the firm.

The indicators aim to monitor the environmental impact of the inputs to the manufacturing process, its operations and products.⁸ Each of those areas of indicators is described in detail below.

The indicators on inputs support reduced use of materials and harmful substances, and their substitution with less damaging alternatives, as well as the increased use of renewable and recyclable materials. The Toolkit tracks inputs through three indicators:

1. Non-renewable materials intensity (use of materials in finite supply as a proportion of production).
2. Restricted substance intensity (use of substances restricted by law as a proportion of production).
3. Recycled/reused materials (use of recycled and reused materials as a proportion of materials use).⁹

The indicators on operations consider the impact and efficiency of transforming inputs into outputs. Monitoring should help to reduce energy use and the volume of waste and emissions. It will also increase the value of material inputs through reprocessing end-of-life materials, replacing or upgrading equipment, and preserving or improving on-site biodiversity. The Toolkit tracks operations through eight indicators:

1. Water intensity (water consumed per unit of output).
2. Energy intensity (energy consumed per unit of output).
3. Renewable proportion of energy consumed (such as biomass, biogas, solar, wind, hydropower).
4. Greenhouse gas intensity (greenhouse gas production per unit of output).
5. Residuals intensity (waste generated per unit of output).
6. Intensity of residual releases to air (air emissions per unit of output).
7. Intensity of residual releases to surface water (effluents released per unit of output).
8. Natural cover (proportion of land occupied that is in a natural state).¹⁰

The indicators on products should support the firm in substituting recycled or renewable materials for non-renewable inputs, reducing the hazardous substances in products, improving the recyclability or biodegradability of products, lowering the product energy requirements and improving product durability. The environmental performance of the firm must reflect the characteristics of its products. Each product has a unique environmental profile and impact throughout its lifecycle. The original product design is a key variable, as it largely determines the overall environmental performance. Indicators on products are as follows:

1. Recycled/reused content of the product (proportion of total weight).
2. Recyclability of the product (proportion that is recyclable).
3. Renewable materials content of the product (proportion that is made up of renewable materials).
4. Non-renewable materials intensity over product lifetime (ratio of annual non-renewable material use to product lifetime).
5. Restricted substances content of the product (proportion made up of restricted substances).
6. Intensity of energy consumption of the product (energy required during one year of typical use per unit of output).
7. Intensity of greenhouse gas emissions from the product (greenhouse gas generated during one year of typical use per unit of output).¹¹

⁸ OECD, 2011b, p. 8.

⁹ Ibid., p. 22.

¹⁰ Ibid., p. 27.

¹¹ Ibid., p. 34.

3. *Ecological footprint*

The measure of human demand on the Earth's ecosystems is known as the ecological footprint. It measures the biologically productive land and sea required to produce all the resources a population consumes, and to absorb its waste. This is then compared against available biocapacity. On the global level, increasing human demand for resources significantly exceeds the pace of renewability. According to the United Nations High Level panel on Global Sustainability, population growth is expected to cause the global demand for food to double by 2030, while demand for energy and water are expected increase by 45 and 30 per cent respectively.

Calculations of ecological footprint can be carried out at a much smaller scale to provide entrepreneurs with information about the environmental impact of materials or business practices. It can also be used to forecast the benefits of greening specific processes or products. The calculation can be used to determine which interventions will yield the best results.

4. *Environmental certification*

Environmental certification can have a number of benefits for SMEs. First, the certification process can help them adopt a systemic approach to sustainability rather than piecemeal solutions in response to urgent cost pressures. By achieving certification, enterprises can reduce waste and costs. Despite the benefits of environmental management systems and environmental certification, few SMEs have been certified. In addition, products that have an environmental certification may have a competitive advantage over products that do not.

The environmental management standard, ISO 14001, emphasizes transparency and continual improvement. It does not define requirements for environmental performance, but encourages compliance with relevant national regulations. The standard provides a framework for companies to monitor and improve their environmental management. At the national level, the number of businesses that have adopted ISO 14001 can be used as an indicator of the overall transition to the green economy (box 1).

The adoption of ISO 14001 in the Arab region has been slow. The lack of Government support and the deficiency of the infrastructure are the most significant hindrances. Nevertheless, an assessment of compliance with ISO 14001 could indicate the progression of Arab SMEs towards the green economy.

Eco-labelling is an important tool to promote eco-efficiency and help firms gain visibility and recognition through the market. Governments and trustworthy third-party organizations set standards of efficiency, test products and award labels to show the energy efficiency of the product. Energy efficiency labelling systems have been introduced by the European Union and in countries such as the United States and Canada. The label displays the energy efficiency rating of the product. Other labelling systems rate the carbon footprint or the environmental impact of a product over its entire lifecycle.

Box 1. Environmental certification in Lebanon

In 2012, a study was conducted in cooperation with the Association of Lebanese Industrialists, ISO and LIBNOR, aiming at confirming the positive relationship between ISO 14001 certification and environmental performance improvement in the Lebanese industrial sector.

A pool of certified SMEs was asked about the major environmental issues of each industry and how ISO 14001 implementation and certification enhanced the environmental performance of their organization. After acquiring ISO 14001 certification and implementing it in the organization, each SME noticed positive changes in environmental performance, according to the environmental issue identified by each industry, namely wastewater, energy consumption, solid waste, air emissions, raw material consumption and water consumption.

Box 1 (*continued*)

Wastewater issues have been resolved in all industries by establishing an on-site wastewater treatment plant and reusing the treated water in the process system again, either for cooling or in the production process when possible. Additionally, cement industries employ separators of water and oil and one implemented a septic tank to treat its pharmaceutical liquid waste with biodegradable products (bioenzymes). As for water consumption, one has installed water saving devices and water meters to detect leaks, and it has also changed the landscape design of the establishment to consume water more efficiently.

Energy consumption has been handled by each industry in a different way. Some companies have created their own power generation plant, employing new generators and more effective burning systems using petroleum coke as fuel (environmentally safer). Moreover, they have enhanced the lighting system of their establishment; light bulbs have been remapped and changed for energy efficiency. The transformer plant has improved its power generators by setting heat exchangers on the exhausts of generators to reduce the consumption of energy and increase efficiency.

As for solid waste, all segregate their waste onsite and contract companies to collect each type of waste separately. However, two of them prevent the generation of solid waste by limiting purchasing orders of raw material in order to prevent stock resulting in waste. Moreover, one company treats its hazardous solid waste to be liquefied and later on treated in the septic tank with bioenzymes.

Concerning air emissions, some companies have substituted 25 per cent of clinker – a generator of carbon dioxide emissions – with other less gas-emitting alternative materials within the production of cement. Also, they placed filters for dust emissions and collection to reuse it in the production process of cement. New generators and latest burning systems using petroleum coke as fuel within the cement plants have reduced gas emissions.

Source: Rana Tabcharani, 2012.

D. ENVIRONMENTAL INDICES

Highly aggregated indices have been developed to quantify social and environmental aspects of sustainable growth. Such indices aim to reflect all the different dimensions of sustainability in a single measurement. For example, the Environmental Sustainability Index evaluated national environmental performance in terms of 21 indicators covering natural resource endowments, pollution levels, environmental management efforts, contributions to protection of the global commons and the capacity of a society to improve its environmental performance over time.

The Environmental Sustainability Index was replaced in 2006 by the Environmental Performance Index, based on 25 indicators that cover public health and the state of the ecosystem. Those indicators monitor how close countries are to the environmental policy goals that have been defined at the national level.

Table 2 provides a sample of those rankings. A high score on the Environmental Sustainability Index or the Environmental Performance Index signifies high achievement. The score of Arab countries ranged between 33.6 and 51.8 on the Sustainability Index in 2005, while the score on the Performance Index ranged between 25.32 and 55.18 in 2010. Most oil-producing countries in the Arab region scored low on the Performance Index.

TABLE 2. RANKING OF SELECTED ARAB COUNTRIES ON ENVIRONMENTAL INDICES

Country	Environmental sustainability index	Environmental performance index	
	2005	2006	2010
Algeria	46.0	66.2	48.56
Egypt	44.0	57.9	55.18
Iraq	33.6	-	25.32
Jordan	47.8	66.0	42.16
Kuwait	36.6	Na	35.54
Lebanon	40.5	76.7	47.35
Libya	42.3	-	37.68
Mauritania	42.6	32.0	-
Morocco	44.8	64.1	45.76
Oman	47.9	67.9	44.00
Saudi Arabia	37.8	68.3	49.97
Sudan	35.9	44.0	46.00
Syrian Arab Republic	43.8	55.3	42.75
Tunisia	51.8	60.0	46.66
United Arab Emirates	44.6	73.2	50.91
Yemen	37.3	45.2	35.49

Source: <http://epi.yale.edu/>.

Note: In 2012, Switzerland scored 76.69 on the Environmental Performance Index. Egypt achieved the highest score among Arab countries, and ranked sixtieth overall.

E. ENVIRONMENTAL STATISTICS AND ACCOUNTS

Arab countries are producing data and statistics that can be used to assess the status of the green economy. Such statistics and indicators support and feed into the monitoring tools presented above. Accounting is, in fact, part of the information pyramid and is essential to produce coherent data that underlie the indicators. Those initiatives and tools are complementary to the task of measuring the green transition.

Data and statistics from the region are compiled and made available in a number of ways. Electronic access to data from the region has been provided by the Programme on Governance in the Arab Region. Its unified database (www.arabstats.org) includes statistical indicators for human development, governance, progress toward the MDGs, and sustainable development. Likewise, ESCWA has developed a strong information system for environment, water and energy statistics (<http://esis.escwa.org.lb>). Those databases increase the accessibility and use of data.

Since 2007, ESCWA has published the Compendium of Environment Statistics in the ESCWA Region every two years. Each issue covers a number of themes, including the following; freshwater management; water accounts and environmental protection expenditure; waste management; energy consumption; air pollution; fisheries; biodiversity; and MDG 7. The data presented in those publications covered the 14 countries that were members of ESCWA at that time.

International stakeholders have promoted the use of environmental accounts to support the three pillars of sustainable development. These accounts collect information on the natural resources capital, their connected expenditures and status. For example, the System of Environmental-Economic Accounts (SEEA) contains agreed standard concepts, definitions, classifications, accounting rules and tables for producing internationally comparable statistics on the environment and its relationship with the economy. Through SEEA, statistical data are organized for the derivation of indicators and descriptive statistics to monitor the interactions between economic activity and the environment.

The United Nations Statistical Commission adopted the central framework of SEEA as the first international standard for environmental-economic accounting. The system also includes experimental accounts for ecosystems and extensions and applications. Subsystems of the central framework elaborate on specific resources or sectors, including energy, water, fisheries, land and ecosystems, and agriculture. In the Arab region, only a few countries have partially developed SEEA for energy and water.

1. *Water*

The transition to a green economy requires that all stakeholders carefully manage natural resources, especially water and energy. Private households, the public sector, large companies and SMEs need to be aware of the impact that their water use can have. Indicators are needed to show the source and availability of water, the amount required for economic activities and outputs at the global and national levels and in individual sectors.

At the global level, there are many methods of quantifying water resources. The Food and Agriculture Organization of the United Nations uses a type of water accounting to calculate national water balances. Of particular relevance are indicators linked with efficiency and productivity, the conversion of water into goods and services, and measures of monetary value.

Water productivity (product units/m³ water) captures the ratio of net benefits derived to water used. Water productivity can be measured for crops, forestry, fisheries, livestock and industrial systems. In general terms, increased water productivity means increasing the benefit derived from each unit of water input.

Water-use efficiency (m³ water/product units) is defined as the ratio of the water input to the useful economic/product output of a system or activity. Through greater water-use efficiency, less water is used to achieve the same or more goods and services.

Water balances represent the fundamental approach to accounting for the flow of water into and out of a system. Many different sources of information are needed for water accounting, including national and international compliance reporting; monitoring networks and observation systems; scientific programmes and modelling; and various geographic information systems. For economic and product-related water use, sectoral statistics and national accounts can also be used.

It is vital to establish water accounts for the Arab region to deal with water scarcity and increasing demand for freshwater. Increasing urbanization and agricultural development have added to the burdens on water resources, exacerbating the gap between supply and demand. Likewise, wastewater treatment facilities lack the capacity to deal with the increasing volume of wastewater. To deal with those challenges, decision makers can use the System of Environmental Economic Accounting for Water (SEEAW) to support Integrated Water Resources Management. Bahrain, Egypt and Oman have issued pilot water reports according to SEEAW, and Jordan has issued advanced reports (box 2).

Box 2. Measuring water use – Jordan Water Information System

“Jordan, one of the most water-scarce countries in the world, has established a detailed metering system and a thorough accounting system which relates physical water flows to the economy and enables an environmentally extended input-output analysis. Those two elements have been joined and made operable within an extensive Water Information System.

Data are collected and analysed via the system that brings together raw data from across the country, including real-time meter and telemetry data, and stored in a centralised database for analysis. A range of software-based analysis and planning tools such as Water Evaluation and Planning System, the Water Information System and ArcGIS have been integrated into the national planning and operations processes. A key aim of the Water Information System is to compile physical and monetary data on water use and supply and on environmental protection and management expenditures, all disaggregated according to International Standard Industrial Classification specifications.

Box 2 (continued)

These data are further analysed to serve multiple purposes. They can be disaggregated to give a more detailed picture of water use in products and activities; used to elucidate the physical flows of water in the economy; analysed using environmentally-extended input-output analysis to deliver policy-relevant information on indirect water use by final demand categories; used to support the development of environmental resource and flow accounts; and used to prepare modified national accounts that include consumption of national resource stocks and impacts of pollution”.

Source: UNEP, 2012b, p. 21.

2. Energy

The Annual Questionnaire on Energy Statistics is a key source of information for statistical databases and publications of the United Nations Statistics Division. Additional useful information is provided by other statistical publications of the International Energy Agency, the Statistical Office of the European Communities (Eurostat), the International Atomic Energy Agency and the Organization of the Petroleum Exporting Countries.

The Energy Statistics Database of the United Nations provides statistics on production, trade, transformation and consumption (end-use) for solid, liquid and gaseous fuels, electricity and heat. The data are referred to in original units (e.g. metric tonnes, GWh) as well as calorific values to allow comparisons between fuel types in a common energy unit (terajoules).¹²

3. National environmental accounts and EGS

Given the importance of SMEs for economies and employment in the region, it is likely that a useful measure of the success of green economy policies implemented by Governments will be the growth of SMEs and jobs in EGS sectors. Nevertheless, there is currently no internationally agreed definition or classification for EGS. As it is one of the most dynamic sectors of the global economy, the basket of goods and services that are part of the category is evolving all the time. The World Trade Organization, OECD and the World Wide Fund for Nature are each attempting to draft a final, agreed list, but much still needs to be done to define a clear classification of EGS and open the way to a final identification of nomenclatures in national statistic offices for a clear monitoring of SMEs engaging in those businesses.

Although standard statistical nomenclatures do not recognize EGS as a single, precise sector, they can be used to identify those activities. EGS include activities from many different economic sectors, and some environment-specific services, such as waste collection and management, are easily identified by national accounts codes. They can also be identified by selecting goods, services and technologies that have an environmental purpose, and tracking related account codes.¹³

Given the current level of national environmental accounts for energy and water in the Arab region, it is extremely challenging to identify producers of EGS. As a consequence, statistical nomenclatures and national accounts have to be further developed in the Arab region to become effective tools for monitoring the contribution of the productive sectors to the green economy. Nevertheless, national environmental accounts can play an important role in the identification of the new green productive sectors or EGS by focusing on the supply side and identifying the producers of goods.

¹² <http://unstats.un.org/unsd/envaccounting/seeae/>.

¹³ European Commission, 2009, p. 71.

F. SUMMARY

Monitoring the transition to the green economy will require specific indicators that can focus on national economic, social and environmental performance and drill down to the enterprise level to account for internal changes related to the green transition. Table 3 provides a concise overview of the key indicators that Governments and stakeholders in the Arab region can use to monitor the transition to the green economy at the macro, meso and micro levels.

TABLE 3. SUMMARY OF GREEN ECONOMY INDICATORS

	Economic transformation	Resource efficiency	Progress and well-being	Other
Macro	Monitoring sustainable development			
Commission on Sustainable Development	<ul style="list-style-type: none"> - Investment share in GDP - Official development assistance as share of gross national income, given or received 	<ul style="list-style-type: none"> - Environmental and resource productivity: carbon dioxide, energy, material, water 	<ul style="list-style-type: none"> - Poverty (proportion living below poverty line, access to various facilities and living conditions) - Governance, Health, Education, Demographics 	<ul style="list-style-type: none"> - Socioeconomic characteristics of growth: GDP, inflation, unemployment and so on - Vulnerability and preparedness to natural hazards - State of the environment indicators: protected areas, biodiversity
Meso	Monitoring the green economy and green growth			
OECD Green Growth Indicators	<ul style="list-style-type: none"> - Research and development, patents and innovation related to green growth or environment - Production of EGS - International financial flows of importance to green growth - Environmental taxation and pricing 	<ul style="list-style-type: none"> - Environmental and resource productivity: carbon dioxide, energy, material, water, multi-factor 	<ul style="list-style-type: none"> - Environmental quality of life: environmentally induced health problems, exposure to natural or industrial risks, and related costs and economic losses - Access to sanitation and drinking water 	<ul style="list-style-type: none"> - Socioeconomic characteristics of growth: GDP, inflation, unemployment - Natural asset base: renewable stocks (freshwater, fish, forest) and non-renewable stocks (mineral), ecosystems resources
OECD Measure of the Potential of Local green growth	<ul style="list-style-type: none"> - Research and development, patents and innovation related to green growth or environment - Production and employment in EGS - Foreign direct investment 	<ul style="list-style-type: none"> - Environmental and resource productivity: carbon dioxide, energy, material, water, multi-factor 		
Micro	Monitoring SME performances			
UNIDO RECP indicators	<ul style="list-style-type: none"> - Share of renewable energy 	<ul style="list-style-type: none"> - Environmental and resource productivity: carbon dioxide, energy, material, water, land, waste - efficiency of various gas and pollutants emissions 		

TABLE 3 (continued)

	Economic transformation	Resource efficiency	Progress and well-being	Other
OECD Sustainable Manufacturing Toolkit	- Share of renewable energy	- Intensity of various inputs, material consumption and emission and products per unit of output: carbon dioxide, energy, material, water, land, waste		
Ecological footprint	Measure of the biologically productive land and sea required to produce all the resources a population consumes, and to absorb its waste, using prevailing technology			
Highly aggregated indices				
Environmental Performance Index	- Share of renewable energy - Agricultural subsidies	- Efficiency of various gas and pollutants emissions	- Child mortality - Access to sanitation, to drinking water	- Various indicators of the state of the environment: air pollution level, critical habitat protection, forest cover and so on
Environmental statistics and environmental accounts				
SEEA	Environmental-economic accounts derived from various environmental and economic statistical data through a common framework			

III. GREEN ECONOMY TRANSITION IN THE ARAB REGION

The preparedness of the Arab region to transition to a green economy was confirmed in April 2012, when CAMRE issued the Arab Ministerial Declaration on the United Nations Conference on Sustainable Development. The Declaration stated specifically that Arab countries should adopt green economy approaches based on national needs and priorities rather than applying them as a standard model, and that attention should also encompass the social pillar, notably as related to employment creation. It also recognized that unemployment was one of the main concerns facing youth and it underscored the importance of creating new and promising employment opportunities.

The labour force in the Arab region is characterized by the large youth population. Young people have benefited from improved literacy rates, and female tertiary enrolment exceeds that of males in several Arab countries. Young people are also more mobile and better informed than previous generations were. Although opportunities for education have improved, opportunities for employment have not. Labour market rigidities and skills mismatch have contributed to the large share of unemployed youth. In Arab countries, unemployment disproportionately impacts young people. In 2006, youth unemployment reached 30 per cent, and youth accounted for more than 50 per cent of all unemployed in most Arab countries.

In recent years, Arab Governments have expressed their commitment to support youth employment and endorsed the establishment of an Arab fund to support SMEs. The goal of transitioning to a green economy is compatible with initiatives to support SMEs and youth employment, and alleviate poverty. Arab Governments must design programmes that provide job opportunities for young people in the process of achieving sustainable development goals such as increasing access to electricity, clean drinking water, sanitation, sustainable transport and healthcare and other basic services.

In addition to sponsoring projects and programmes, Governments must foster entrepreneurship, especially for green SMEs. Entrepreneurship builds economic and social participation and facilitates upward social mobility. It taps into talent and innovation and can allow marginalized people or disadvantage groups to create their own opportunities to participate in the economy. Promoting entrepreneurship also means breaking the culture of dependency and encouraging active participation in the profound social and economic transformations implied by the low-carbon transition. Besides its social and employment implications, a sustained entrepreneurial dynamic can favour system-level competitiveness. In a thriving entrepreneurial environment, productivity is enhanced as new ideas and innovations are continuously brought to the market and new ventures displace less productive ones, especially in knowledge-based sectors.

Another action that Governments can take is to adopt and enforce environmental regulatory frameworks that will provide the impetus to create new businesses, open new markets and change current practices.

A. DRIVERS OF THE TRANSITION

It is important to assess the drivers of the transition to the green economy and their implementation at the regional level. Drivers of the transition can be led at the domestic level, at the international level, or by the private sector, as outlined below.

1. *Domestics drivers*

The role of Governments is critical in driving the transition through the reform of existing regulations that impact the prospects of the green economy. To promote the success of the transition, Governments should provide incentives to the private sector and take steps to protect low-income firms and households from any distributional effects. To ease the transition, Governments can facilitate labour-market adjustments and leverage public procurement to directly create or strengthen markets for energy efficient goods and services.

The Government of the United Arab Emirates has actively promoted the transition to the green economy. It has taken steps to identify sectors for public intervention and to facilitate environmental planning (box 3).

Box 3. Al Basama al Beeiya – United Arab Emirates

“The United Arab Emirates launched a major environmental initiative based on the ecological footprint. In 2006, the United Arab Emirates had the highest per capita footprint in the world, more than five times higher than the biocapacity globally available per person.

In order to better understand their ecological footprint, in October 2007, the United Arab Emirates launched the Al Basama al Beeiya (ecological footprint) initiative as a “national effort to ensure a sustainable future by measuring and understanding the impact of our ways of living on planet Earth”. The initiative involves multiple stakeholders across the nation to work towards developing important guidelines for a more resource-conscious and resource-efficient Government and society.

The four core partners in the Al Basama Al Beeiya initiative are the Ministry of Environment and Water, the Abu Dhabi Global Environmental Data Initiative, the Emirates Wildlife Society – World Wide Fund for Nature and the Global Footprint Network, an international non-profit organization that promotes ecological footprint as sustainability metric worldwide.

The key aims of the initiative are to better understand the footprint methodology, review data for the Living Planet Report 2008 and beyond and look at the possible institutionalization of the footprint in the United Arab Emirates. In its first year, the Initiative contributed to a more robust representation of the footprint of the country by verifying data on population and carbon footprint. In the second year, an environmentally extended input-output approach to ecological footprinting was performed to break down the national footprint value by industrial sectors, final demand, and household consumption categories. This helped disaggregate national demand by key activities, identify areas for potential environmental policy intervention and facilitate sustainable planning through a science-based decision making process. The initiative has also successfully raised awareness of the footprint concept among key national stakeholders”.

Source: Sakmar et al., 2011, pp. 4-5 and 10-11.

Domestic actions that encourage green growth include carbon taxes, green energy funds, payment for ecosystem services schemes, renewable energy initiatives, sustainable public procurement initiatives and natural resource management initiatives. In the Arab region, as in many other regions, the public sector is a large and visible consumer, whose actions can strongly influence the behaviour of firms and citizens. Well-designed feed-in tariff programmes offer investors the transparency, longevity and certainty that they seek, but the heavily subsidized energy markets in some Arab countries can create challenges.

National business incubators could be established to provide business advisory support, including a full suite of services and network facilitation to local entrepreneurs and start-ups in all sectors.

Public procurement of energy efficient goods and services provides an opportunity to influence markets while creating consistent and stable demand for new and emerging technologies. For example, in Egypt, a public programme for the installation of compact fluorescent lamps has been launched (box 4). Governments can issue technical specifications of goods and services, which can influence the production and investment choices of suppliers.

Box 4. Compact fluorescent lamps in Egypt

Total energy consumption in Egypt accounts for 80 million tons oil equivalent with electric consumption at 127 terawatt hours (2010/2011) and growing at 7 per cent annually in recent years. Public buildings account for approximately 5 per cent of total electric consumption, and so special focus was directed towards public buildings, street lighting and compact fluorescent lamps.

In 2007, Egypt set a target to reduce consumption by 20 per cent by 2020. The recent 'Energy Efficiency Road map' recommended a decentralized approach to market implementation with sector-specific energy efficiency units. In 2009, a unit was created and annexed to the Supreme Energy Council, a high-level committee of 12 ministers headed by the Prime Minister.

During 2006 and 2007 the "Energy Efficiency Public Procurement pilot" was implemented jointly by the United States Agency for International Development and the Energy Efficiency Project of the United Nations Development Programme at the Ministry of Water Resources and Irrigation in Cairo. In 2010, based on the success of that project, the Supreme Energy Council approved a plan to improve the energy efficiency of 20 Government buildings under a central procurement approach, and sought public and private support through a performance-based implementation mechanism.

Moreover, the Ministry of Electricity and Energy began an ambitious programme to promote compact fluorescent lamps through electricity distribution companies with a subsidy of 50 per cent of the normal retail price. To date 11.7 million lamps have been sold and an additional 6 million are planned to be sold during 2013.

The Ministry of Finance has allocated 260 million Egyptian pounds to replace conventional street lamps with efficient and lower wattage lamps over 2 years. The target was to install one million lamps (about 25 per cent of all street lamps in Egypt). About 250 thousand lamps have been installed to date.

Source: Yassin, 2012.

Other drivers target market failures and include market-based approaches that internalize environmental externalities. To correct market failures, Governments can enact regulations and standards or even a complete ban on certain activities if need be, although the additional administrative burden of regulations and compliance costs must not exceed their expected benefits. Where entry costs are high, Governments can invest in research and development, and support the deployment of green technologies. Finally, national programmes to rate products or businesses (eco-labelling) and other information-based initiatives can raise producer and consumer awareness.

The Governments of Tunisia (box 5) and Lebanon (box 6) have been actively working to create a positive environment for the green economy.

Box 5. Creating an environment that fosters green growth in Tunisia

Tunisia has many regulatory frameworks related to environmental preservation and sustainable development. Environmental regulations indirectly support the creation of businesses in the environmental field or 'green businesses'. Some of those regulations are outlined below:

The Investments Incentive Code encourages investments in sustainable development, especially in remote regions of the country where economic growth is still low. The Code states that companies that collect, process and treat waste, conduct energy conservation or geothermal energy research, or produce and market renewable energy shall be exempted from import taxes and value added tax, and are eligible for deductions (for a maximum of 50 per cent) on the taxable amount of the net profit of investments.

The Energy Conservation Law, establishes different actions of energy conservation, clarifies the mission of the National Agency for Energy Conservation and identifies the advantages granted to all energy efficiency measures. Through programmes and projects, the law has led to the development of solar water heating, energy efficiency in buildings and industry and so on, and was an enabling factor for emerging green enterprises in the field of renewable energy and energy efficiency.

Box 5 (continued)

The Law on Waste Management sets the legal conditions that regulate the waste sector and takes into account the collection, sorting and recycling of different types of solid waste. This law encourages private companies to invest in the collection, transport and recycling of waste, and as a result, many SMEs have emerged in related fields.

The Law on Organic Agriculture focuses on four components: (i) production, processing and commercialization; (ii) control and certification systems; (iii) establishment of a national board for organic agriculture; and (iv) applicable penalties. The law led to a significant increase of investments in organic farms and to greater product diversification. Many organic products are exported, and the sector makes a significant contribution to the Tunisian economy. In 2010, organic farming contributed nearly 13 per cent of GDP. The sector attracted 9 per cent of gross investment and provided 16 per cent of employment.

Source: Regional Activity Centre for Cleaner Production, 2011. pp. 27-29.

Box 6. Environmental legislation in Lebanon

Despite wars, political instability and decades of accumulated debt, Lebanon has exerted efforts to strengthen its institutional and legal infrastructure with the assistance of the international community. As such, it has several green initiatives and success stories.

According to the World Bank, Lebanon is the only country in the Middle East and North Africa (MENA) that has comprehensively assessed its environmental legislation through its programme on Strengthening the Environmental Legislation Development and Application System in Lebanon. The programme is implemented by the Ministry of E and engages many stakeholders including parliament, ministries, universities and NGOs, which help raise awareness about environmental legislation development and promote environmental law education.

On another front, the Council for Development and Reconstruction put together a National Land Use Master Plan for Lebanon, which was approved by the Council of Ministers in 2009 (Decree No. 2366/2009). The plan suggests land use categories and sectoral action plans and is considered a reference for the urban planning policy in the country, defining the principles for the development of regions, in terms of infrastructure and activities best suited for each location (MOE, 2012 and MOSA, 2011).

The main law to guarantee an environmentally-conscious development, if properly enforced, is Environmental Law No. 444/2002, approved by the Lebanese parliament in 2002.

2. International drivers

Partnerships and the international level can promote the green transition in the Arab region by accelerating and expanding innovation and stimulating international venture capital markets. Such partnerships would broaden cooperation between public and private firms and maximize the benefit of research and development. International initiatives to support green growth innovation include regional institutions such as science foundations that could encourage greater South-South cooperation and applied research into all types of innovation, and encourage innovators to share intellectual property.

3. Private drivers

Large regional dedicated funds can encourage private investment in developing country projects or in companies that meet specified social and environmental criteria. Financial instruments include but are not limited to concessional loans, sovereign guaranteed loans, first loss funds, partial credit or risk guarantees, and equity or quasi-equity investments.

Climate-related financing offered by multilateral development banks have been able to leverage large flows of private investment by mitigating risks and developing the capacity of domestic financial institutions.

The Global Energy Transfer Feed-in Tariff programme promotes access to renewable energy in the developing world through new public-private partnerships. The programme coordinates bilateral and multilateral donors, along with technical assistance and capacity-building to provide incentives for power producers to generate renewable energy. Initiatives that use a similar structure include Desertec, a large-scale programme to generate solar and wind power in the Sahara desert for use in North Africa and export to Europe.

Suitably adapted, such mechanisms could also dramatically expand off-grid renewable-energy solutions across rural economies, provide reliable energy to millions of people and trigger a new green revolution in the countryside.

Another driver that can play an important role is the creation of one-stop-shops in the different countries. So called ‘green help desks’ support entrepreneurs in gathering information for on green sectors (box 7).

Box 7. Green help desks in the Arab region

A recent project implemented by ESCWA to strengthen the capacity of its member countries in supporting green productive sectors, is the creation of Green Production Help Desks. Pilot help desks are being hosted by the Association of Lebanese Industrialists in Lebanon, the Royal Scientific Society in Jordan and the Ministry of Commerce and Industry in Oman. ESCWA is providing the help desks with the information they need, through mapping exercises, among other things. The help desks aim to raise awareness, collect information and help SMEs take advantage of the opportunities of a green economy. The activities implemented include the following:

- ✓ Collect and disseminate information on green growth and green business opportunities with a specific focus on policy tools that beneficiaries can use, including conducting surveys on financing schemes, regulations, and national and international support policies for green production;
- ✓ Facilitate networks of experts and institutions in the host country that specialize in issues related to green productive sectors;
- ✓ Organize training of trainers and technical training workshops on green development, energy efficiency, sustainable production and consumption, climate change mitigation and adaptation, and cleaner production;
- ✓ Conduct studies to support decision-making for central and local governments and regional, international organizations;
- ✓ Create a platform for matching venture capital with green businesses in the region;
- ✓ Gather and disseminate good practice and case studies;
- ✓ Develop and implement new projects and initiatives;
- ✓ Publish information online.

In the course of their work, the help desks will record and develop good practice which will be reflected in the project guidelines. After the completion of the project, the guidelines will be shared with other member countries so that they can develop similar help desks.

B. OVERCOMING CHALLENGES TO THE TRANSITION

Although Arab countries have committed to engage in the green economy transition process, several obstacles stand in their way. Steps to overcome those challenges are outlined below.

1. *Trade-offs and synergies*

In the Arab region, the transition to a green economy must also create new job opportunities to reduce youth unemployment and foster equitable growth. The high initial investments associated with shifting from fossil fuels to renewable energy may cause the price of energy and energy-dependent services and commodities to rise, which may have an unfavourable impact on economies of the region that are already strained. Special attention should be given to trade-offs between sectors as the green economy transition may create jobs in some sectors and eliminate jobs in others. Governments must analyse the trade-offs of green economy policy options with regard to environmental and social outcomes, and identify policy synergies.

The transition to the green economy should take the water-energy-food security nexus into consideration and adopt an approach that emphasizes sustainability and promotes the efficient management of natural resources. The Arab region has become highly dependent on food imports because water resources and arable land are in short supply. The countries of the region are therefore vulnerable to food price fluctuations, which can have major political implications.

A green economy in the Arab region should thus support the nexus and interdependency perspective, allowing policymakers to design appropriate policies and strategies to develop synergies. The key challenge for policymakers is the lack of data, tools and institutional capacity in the region.

2. *Green finance*

The United Nations Framework Convention on Climate Change and the Kyoto Protocol, including the Clean Development Mechanism and the Global Environment Facility provide funding at the global level for climate change adaptation and mitigation. Those financial mechanisms and others like them facilitate participation in the green economy, yet Arab countries have had limited access to those funding mechanisms. Arab development banks have also funded sustainable development projects, however, much more is needed. In response to that need, efforts have been made to establish the Arab Environment Facility, dedicated to financing green initiatives.

National banks may be reluctant to finance green projects for a number of reasons. First, they may lack the capacity to assess the risks or merits of the project. In general, there may be little or no information on existing initiatives. There is a role for Governments to play to help finance green projects in the region. Through such policy options as tax-equity legislation, Governments can facilitate investor participation, provide credit for research and development and green infrastructure.

Regional challenges

- 50 million people do not have access to safe drinking water;
- Severe water scarcity by 2025;
- 97 million people do not have access to adequate sanitation;
- 34 per cent of irrigated agricultural land has been degraded;
- US\$5 billion of losses in agricultural revenue per year because of desertification.

Natural/Systemic

Water Scarcity:

- 70 per cent of the region is arid;
- 11 ESCWA member countries face water scarcity;
- 80 per cent of water is transboundary.

Climate Variability and Climate Change:

- Water quantity versus quality;
- Sea level rise, salt water intrusion into coastal aquifers;
- Drought/reduction in crop yield;
- Land degradation, soil erosion;
- Increased flooding risks;
- Ecosystem deterioration.

At the same time, policy measures are needed to improve the capacity of businesses and entrepreneurs to approach and attract investors to green projects. In fact, it is often the case that SMEs and entrepreneurs have limited knowledge of funding sources and lack the ability to develop business plans with adequate information for prospective financiers.

3. *Technology transfer*

New green technologies, innovative products and more efficient processes will play a key role in the region's transition to a greener economy. Investments in research and development to be available locally in the Arab Region are strongly needed and encouraged.

A successful transition to a green economy can be ensured if the national infrastructures are able to replicate and internalise the internationally available state of the art technologies. A strong 'alliance' between Ministries of education, universities, vocational training institutes and technical schools is, thus, needed to ensure that young generations are well trained for this important shift in the sectors of energy and water efficiency, sustainable transportation and agriculture and other EGS sectors.

Arab Governments should help the business sector overcome challenges associated with adopting more sustainable practices, and facilitate technology transfer. Firms often lack knowledge of green technologies and eco-solutions and the capabilities to adapt them to their needs and practices. Governments should facilitate business linkages with service and technology providers, including research centres and universities, to increase adoption, learning and incremental innovation. For example, the ESCWA Technology Centre aims to boost socioeconomic development by assisting member countries in acquiring the necessary tools and capacity to achieve technological parity with other regions of the world. Business networking and collaboration promote the exchange of knowledge make it possible to identify common needs that could be met through scale-efficient services and technical assistance.

C. EXAMPLES FROM THE REGION

The progress of the region towards sustainable development, particularly in education, health and the environment, was noted in the outcome document of the Arab Regional Preparatory meeting for Rio+20, held in October 2011. Moreover, sectors such as renewable energy, clean technology, water recycling, green buildings, sustainable transport and green electricity alternatives including natural gas have the potential to benefit each dimension of sustainable development.

This section outlines examples of green economy initiatives in the region along with indicators that could be used to monitor those initiatives. At the end of each section, the most appropriate indicators or monitoring tools are suggested, though it should be understood that others indicators could also be used.

1. *Renewable energy*

(a) *Egypt*

Currently, Egypt is the only ESCWA member country heavily committing to shift its energy production to a renewable path. The New and Renewable Energy Authority (NREA) in Egypt has developed a number of photovoltaic and concentrated solar power installations. In addition to generating electricity for a variety of renewable resource-related activities, solar power stations have created opportunities for SMEs. Enterprises are needed to install and maintain equipment. Furthermore, wind farms are being established on a large scale. Four wind farms are planned for construction in the Gulf of Suez, and the tendering process has begun for two of them. The wind farms are expected to generate 250 MW each.

Egypt is attempting to satisfy 20 per cent of its energy needs through renewable energy sources by 2020. Several projects, such as the Kuraymat hybrid plant, are in progress and the Kom Ombo plant is to be

built in 2017. In addition, Egypt has developed large-scale wind farms in Hurghada and Zafarana with a capacity of 430 MW and plans to increase overall wind energy production to 7200 MW.

(b) *Jordan*

The Renewable Energy Law stipulates that businesses with solar energy systems or wind turbines will have the right to sell excess electricity back to their electricity provider at the full retail rate. The law also requires the National Electric Power Company to purchase all electricity generation from utility-scale renewable energy projects. To meet national renewable energy targets, Jordan plans to develop wind farms to generate 600 MW, solar power stations to generate between 300 MW and 600 MW, and generate an additional 30 to 50 MW through biomass projects.

(c) *Qatar*

In cooperation with a German firm, the Qatar Foundation will produce poly-silicon, the main ingredient in solar panels. The initiative is expected to create opportunities for Arab SMEs that participate in the supply and distribution chains for environmental products.

(d) *Syrian Arab Republic*

National demand for electricity increased by 75 per cent over the past decade, and the Government predicted it would triple in the next 20 years. In cooperation with the German Agency for International Cooperation, a new plan was drafted for Syrian energy from 2011 to 2030. To reach national renewable energy targets, the Syrian Arab Republic planned to build two wind farms (100 MW and 30 MW), and sought investments from the domestic and international private sectors.

(e) *United Arab Emirates*

Masdar, a city in Abu Dhabi, is planned to be the first zero-carbon and zero-waste city in the world. The project is planned to provide 7 per cent of national power with renewable energy sources by 2020, though the project is behind schedule.

The International Renewable Energy Agency was established in 2009 to collect, generate and share knowledge about renewable energy. It provides advice on the financing of renewable-energy projects and is building a global database of policies to promote renewable energy. The Agency is headquartered in Abu Dhabi and has a membership of 149 countries.

(f) *Lebanon*

The Lebanese Institute for Industrial Research Development and Technology has organized training programmes on the manufacture and installation of solar heaters for domestic and industrial uses. Moreover, commercial banks in partnership with the Central Bank of Lebanon are offering interest-free loans for solar heaters with a repayment period of up to five years. In addition, the Ministry of Energy and Water is giving grants for solar heaters to encourage the national market. Because the use of solar water heaters in Lebanon is economically feasible, the initiative has succeeded in reducing ozone depleting substances, supported micro and small enterprises engaged in the development of solar energy projects.

(g) *Saudi Arabia*

King Abdulaziz City for Science and Technology has launched a national initiative for water desalination using solar energy.

(h) *Tunisia*

The Government has issued a law establishing an “energy conservation system” and created a funding mechanism to back it in an effort to reduce dependence on oil and gas. The plan is to increase the share of renewable energy sources to 4.3 per cent by 2014. It includes the use of photovoltaic systems, solar water heating systems and solar concentrated power units for electricity generation. Financial and fiscal support combines a capital grant qualifying for a value added tax exemption, customs duty reduction and a bank loan with a reduced interest rate.

(i) *Morocco*

To benefit from its solar potential, Morocco is building a 500 megawatt concentrated solar power plant in Ouarzazate, under a public-private partnership and financing through different donors. Costs are high as demand is low and demand is low due to high costs. Markets need to be secured for the endeavour to succeed and provide the desired economic opportunity to its citizens.

All the examples from the Arab region demonstrate that the policymakers are seriously considering renewable energy as an alternative to conventional polluting energy sources and that is a clear sign of transition towards a green economy.

Suggested indicators for renewable energy	
OECD Green Growth Indicators:	Carbon and energy productivity
National Environmental Accounts:	Energy balances
UNEP Indicators on Green Economy:	Efficient use in production of energy

2. *Tourism*

The development of medical tourism cities in Jordan and the United Arab Emirates (one is also proposed for the Greater Delta region of Egypt) will result in the development of specialist clusters and should lead in creating SME opportunities in the area of green building, because medical facilities are major consumers of energy.

(a) *Jordan*

In 1995, the first Environmental Protection Law was introduced and an Environmental Police Unit was established in 2006. Jordan has successfully developed its ecotourism sector, which has provided important economic and social benefits along with environmental protection. The Royal Society for the Conservation of Nature has developed a model may be of use to other Arab countries that wish to bolster SME development and protect precious ecosystems.

(b) *Egypt*

The Ministry of Tourism has promoted ecotourism near Al Fayoum city, North and South Sinai and in the Western and Eastern desert. Adventure tourism is closely linked with ecotourism and includes desert safaris, sailing and scuba diving. According to the Adventure Tourism Development Index report of 2009, Egypt is one of the top destinations, ranking nineteenth in 2008 and 2009. In addition, the Ministry of Tourism is implementing projects that emphasize eco-compatibility as a driver of decision-making, assure balanced economic exploitation and environmental control, optimize the use of beaches through leasing with public access and create common areas for socialization and recreational activities.

However, there is a need for greater policy coherence between economic, environmental and social concerns. In order to meet present and future challenges, Egypt must adopt green economy principles and foster sustainable growth.

(c) *Lebanon*

The Lebanon Mountain Trail is a project and an established association with the aim of promoting and protecting trails. The goals of the association are three-fold: (1) environmental; (2) economic; and (3) social as it involves tourists, local people and the natural environment. It boosts and enriches the experience of tourists, enhances the economic opportunities of rural mountain areas and enables the preservation of the natural heritage of the region.

Suggested indicators for tourism	
OECD Green Growth Indicators (Local):	Employment opportunities in EGS
Sustainable Development Indicators:	Ecotourism contribution to GDP
OECD Green Growth Indicators:	Biological diversity and ecosystems

3. *Green buildings*

Abu Dhabi is pioneering new, green cities for the future. Saudi Arabia has similar plans, and the private sector also has some leading players in green technology. Box 8 describes policies in Bahrain to encourage the construction of green buildings.

(a) *Egypt*

The Green Pyramid rating system was issued by a ministerial decree in December 2010, and includes ecology, energy efficiency, water efficiency, materials and resources, indoor environmental quality, management and innovation. Through consultancy and professional advice, the system's process model of sustainable design can assist in the development of environmentally friendly buildings.

The resort city of El Gouna on the Red Sea is an eco-friendly development and a commercial success. The initiatives Green Star (for Egyptian hotels) and Green Globe, one of the most prominent international eco-labelling organizations, have recognized the green credentials of the resort.

(b) *Lebanon*

The Lebanese Green Building Council in partnership with the International Finance Corporation established the Arz Building Rating System to support the adoption of sustainable building practices and the growth of the energy efficiency sector.

Suggested indicators for green buildings	
Ecological Footprint	
Sustainable Development Indicators:	Domestic material consumption
OECD Green Growth Indicators:	Material productivity

Box 8. Bahrain implements eco-friendly policies for the construction of green buildings

In 2012, the Central Municipal Council of Bahrain unveiled draft legislation on new eco-friendly policies for new buildings, scheduled to be implemented at the beginning of 2013. The new regulations follow international environmental standards and encourage better practices, in such areas as lighting, air-conditioning and ventilation, noise, building materials, emissions, among others. Furthermore, buildings must include a minimum of 50 per cent of greenery of the total land space in addition to a green zone that must cover at least 50 per cent of each new roof. Special policies for the disabled and cyclists are also included in the law.

The new building code excludes residential villas and homes. It arrives in a context of dynamic construction developments. Plans for the construction of completely new townships, on an area of 356 ha, were unveiled in June 2012, while the Manama Municipal Council plans to allow the construction of a strip of 50-storey towers lining the seafront.

According to Council chairman Abdulrazzak Al Hattab, “Bahrain is entering a new phase with the implementation of the new green buildings law, which will make it compulsory rather than voluntary as practiced world-wide. The law is so comprehensive and detailed that pollution rates would sharply drop whatever their sources are”.

“Specifics have been outlined and will be finalized by specialists from the ministries and government bodies concerned before being made public a few months before the official implementation of the law on January 1”.

Sources: http://www.zawya.com/story/Bahrain_to_mandate_use_of_ecofriendly_best_practices_in_new_developments-ZAWYA20120916035107/; and http://www.tradearabia.com/news/ENV_219785.html.

4. Transport

Major investments in green public transport are taking place in Saudi Arabia and the United Arab Emirates, and in Amman a metro system is being planned. In Egypt, the Cairo metro is being expanded, but the city is nevertheless in dire need of more green public transport, increased investment and private transport-sharing schemes. There are over 80,000 taxis in the city, and the conversion of some of them to natural gas is ongoing. Compulsory vehicle testing for road worthiness and emissions is another transport initiative with green characteristics (box 9).

Suggested indicators for transport

OECD Green Growth Indicators (Local): Employment opportunities in EGS
Sustainable Development Indicators: Modal split of passenger transportation

Box 9. Use of compressed natural gas in Egypt

In 1992, Egypt introduced the use of natural gas in transports through a small project managed by the Ministry of Petroleum. The project supported two oil companies operating in Egypt to use compressed natural gas technology on their fleets. In addition, two Egyptian companies have been established to convert vehicles to use natural gas.

In 1996, a grant agreement between Egypt and the United States was signed to launch the Cairo Air Improvement Project, which aimed to expand the use of compressed natural gas in public municipal bus fleets, mainly Cairo Transport Authority and Greater Cairo Bus Company. In 2012, there were six compressed natural gas companies, 150 compressed natural gas fuelling stations and 67 conversion centres. Use of natural gas in transport sector in Egypt increased from 813 in 1996 to 173,200 in July 2012. Consumed natural gas in vehicles increased from 0.3 million cubic meters in 1996 to 457 million cubic meters in 2011, and it is expected to reach 879 million cubic meter in 2017; with annual growth rate of 64.6 per cent during 1996-2011 and 14 per cent during 2012-2017. Among all countries using natural gas vehicles in the world, Egypt is No. 11.

Box 9 (continued)

The economic and environmental benefits of the programme are as follows: (1) the predominant use of natural gas instead of gasoline and diesel increased oil exports, (2) creating a total of around 6000 jobs (1000 per company) related to compressed natural gas activities, e.g. vehicle conversion and maintenance/inspection of natural gas vehicles, (3) the project contributed to the mitigation of air pollution in Cairo.

Egypt adopted appropriate policies and measures to encourage the use compressed natural gas. Those actions included the following: (1) developed appropriate infrastructure including natural gas networks, refuelling stations and vehicle conversion centres; (2) encouraged private sector participation; (3) provided conversion incentives such as tax reductions on compressed natural gas components, financial assistance to cover the conversion cost and subsidized prices. In cooperation with Egyptian banks, an electronic “Smart Card” system was provided to facilitate price incentives. Loans for the cost of the conversion can be paid back monthly through normal fuel bills; (4) developed related regulations and standards. Three Egyptian standards have been issued to establish specifications of the vehicle natural gas system, cylinders and refuelling stations. The policies and measures have made the programme one of the most successful and fastest evolving in the world.

Sources: El Din, 2011; and ESCWA, 2009.

5. Agriculture

Throughout the Arab region, NGOs have often led efforts in rural areas to transition to organic agricultural practices.

(a) *Lebanon*

The non-profit organization Souk El Tayyeb, founded in 2004, is the first organic farmers’ market in Lebanon. It promotes organic farming through education programmes targeting farmers and the public at large. By so doing, the organization has strengthened both the supply and demand sides of the value chain.

(b) *Egypt*

The Government has set a number of objectives in order to achieve sustainable agricultural development by 2030. Enhancing efficiency of irrigation systems, using organic fertilizers as opposed to the use of chemical fertilizers, and reducing agricultural waste are some of the components of the agricultural programmes.

Other projects are underway to reduce energy use and increase the efficiency of organic farming and composting. The Sekem Initiative has developed organic farming and installed biodynamic farms and reclaimed almost 17,000 acres of agricultural land. It has allowed for an increase in water holding by up to 70 per cent, a decrease in water consumption by 20-40 per cent and has protected soils from erosion and degradation.

Suggested indicators for agriculture

OECD Green Growth Indicators:	Land resources
Sustainable Development Indicators:	Area under organic farming
National Environmental Accounts:	Water accounts

6. Natural resources

The Lebanon Reforestation Initiative was launched in 2008 with the objective of increasing the green cover from 13 per cent to 20 per cent. The project is expected to run for 20 years. In addition, a national

campaign to combat forest fires aimed to create a conducive environment for the Government of Lebanon to address forest conservation and expansion.

Moreover, the Shouf Biosphere Reserve contributes to the preservation of the natural heritage of Lebanon and is a hub for green jobs for the youth working as tour guides, botanists and horticulturalists, in addition to small enterprises that market local products at stores and the visitors' centres. Businesses in close proximity to the reserve such as restaurants, souvenir shops and cafes have flourished. The reserve is a good example of a natural and cultural heritage conservation site that promotes a green economy and enhances the well-being and income of the inhabitants of surrounding villages.

Suggested indicators for natural resources	
OECD Green Growth Indicators (Local):	Treatment of contaminated land
UNEP Indicators on Green Economy:	Resource efficiency
Environmental Performance Index	

7. Waste Management

(a) *Tunisia*

The National Solid Waste Management Programme was launched in 1993 and nine landfill sites have been created in the cities of Bizerte, Sfax, Kairouan, Gabès, Monastir, Sousse, Nabeul, Médenine and the Island of Djerba. The public system for recovery and reuse of waste (Eco-Lef) was launched in 1998 as a public programme for recycling packaging. By 2005, 200 collection points had been created for recycling and valorization, aiming to collect and treat 85 per cent of domestic waste. To manage the disposal of used lubricating oils, the Eco-Zit programme was established. It collects and regenerates approximately 60 per cent of the total recoverable quantity of used lubricating oils. The collection and disposal of used batteries (including car batteries) is also regulated.

(b) *United Arab Emirates*

Federal authorities have launched a programme in Sharjah, Abu Dhabi and to a lesser extent in Dubai, to highlight the social and environmental benefits of separating household waste.

Suggested indicators for waste management	
OECD Green Growth Indicators:	Access to sewage treatment
UNEP Indicators on Green Economy:	Economic transformation
OECD Green Growth Indicators (Local):	Regional waste collection

IV. SMALL AND MEDIUM ENTERPRISES IN THE ARAB REGION

By creating jobs, fighting poverty and inequality, and improving the integration of women in the economy, SMEs play a significant role in the social pillar of sustainable development. Their contribution to the GDP of many Arab countries is significant, and their role in the provision of goods and services, and improve competitiveness, and thus contribute to the economic pillar of sustainable development. Finally, SMEs can adapt to and alleviate environmental challenges, including climate change, and thus they can proactively respond to the challenge of environmental protection and seize it as an opportunity for growth and sustainable development.

Nevertheless, despite the universally recognized importance of SMEs in sustainable development, studies usually do not focus specifically on green SMEs. As a result, more research is needed on the contribution of SMEs to the transition to a green economy at the national and regional levels. The opportunities and challenges for green SMEs and their active role in sustainable development are presented below.

A. CHARACTERISTICS AND ANALYSIS OF ARAB SMES

When describing Arab SMEs, the first element to stress is their talent of taking advantage of their past and roots. They benefit from traditions of craftsmanship and enterprise going back thousands of years, along with a well-known culture of hospitality. Families engaged in small manufacturing, trade and hospitality have created businesses that crossed local, regional and national borders and have become modern and wealthy businesses.

Arab SMEs have strong roots in local communities and customer networks. Small businesses grow within their community by purchasing raw materials from local businesses and employing loyal and known acquaintances. The strength of their networks and local integration is an asset for the business in terms of its internal processes, access to resources and distribution.

The entrepreneurial profile of SMEs is changing as older generations hand businesses over to their children or grandchildren. Many younger people are university educated and have wide, even global experience. The new generation of Arab entrepreneurs usually speak several languages (Arabic, English and French) and approach their work with flexibility and are willing to adapt to new markets and trends.¹⁴

Most SMEs in the Arab region are concentrated in the commerce and crafts sectors and are privately owned. Many operate in traditional sectors such as food processing, textiles, furniture making, minerals and metals, retail and construction. In addition, SMEs are the main economic drivers of the service sector particularly in such fields as engineering, architecture and petrochemical-related consultancy. Locally-owned businesses in tourism and other major industries are almost always SMEs.

In some cases, SMEs are linked to large national and international enterprises. That relationship is exemplified by SME participation in waste management in United Arab Emirates, where a public-private partnership model has been adopted, which included 12 companies in 2011.¹⁵

In the Arab region, most SMEs are small or microenterprises and there are comparatively few medium-sized enterprises. Significantly, only 0.21 per cent of private enterprises in Egypt have more than 50 employees (about 5000 firms out of 2.34 million); and only 0.70 per cent in Jordan (1039 out of 146,622). Enterprises with fewer than 50 workers account for over 99 per cent of all enterprises in Algeria, Egypt, Jordan, Lebanon, the Syrian Arab Republic, Palestine and Yemen. In those countries, the vast majority of

¹⁴ ESCWA, 2011, p. 7.

¹⁵ Ibid., p. 37.

SMEs have fewer than five employees: 89 per cent in Jordan, 90 per cent in Palestine, 91 per cent in the Syrian Arab Republic and Yemen, over 92 per cent in Egypt and over 93 per cent in Lebanon.¹⁶

In oil-exporting Gulf countries, the public sector and large firms define the business environment. Nevertheless, Governments are encouraging smaller scale entrepreneurship to create jobs. There is wide variation between Arab countries in the economic importance of SMEs (table 4). SMEs in oil-producing countries tend to be in the service sector, which is likely to generate many jobs, being more labour-intensive than other sectors.

TABLE 4. ECONOMIC IMPORTANCE OF SMEs IN SELECTED ARAB COUNTRIES
(Percentage)

Country	Estimated contribution to GDP	Share of total employment	Share of total businesses
Egypt	80	75 (private sector)	99 (non-agriculture sector)
Jordan	50	60	98
Lebanon	99	82	-
Saudi Arabia	-	25	90 70 (industrial sector)
United Arab Emirates	30	86	90

Source: Standard Chartered, 2009, p. 1.

SMEs are the backbone of the Egyptian economy, and make significant contributions to manufacturing (16 per cent) and wholesale and retail trade (11 per cent). Rapid population growth has created significant demand for job creation, therefore, services and other labour-intensive industries are likely to prosper, particularly given that labour in Egypt is relatively cheap.

In Jordan, tourism is a key sector and the industrial sector is likely to see high growth because of the export-oriented policies of the Government. Microenterprises in Jordan comprise 87 per cent of the industrial sector (manufacturing contributes about 18 per cent of GDP). Industrial products account for 90 per cent of total SME exports, and of that share, leather and garments account for 35 per cent and textiles for more than 30 per cent.

In Lebanon, SMEs dominate trade and play a significant role in the construction and service sectors, which have fuelled recent economic growth. The Government has prioritized post-war rebuilding, which has driven the market.

SMEs are very important for the Moroccan economy. They account for 95 per cent of all enterprises, 50 per cent of employment, 30 per cent of exports and 40 per cent of private investment.

In Saudi Arabia, although SMEs represent 90 per cent of total businesses, they account for only about 14 per cent of total industrial production and 8 per cent of the value of industrial exports.

In the Sudanese private sector, 93 per cent of industrial firms have fewer than 10 workers, and provide about 40 per cent of employment in manufacturing. The private sector as a whole accounts for about 84 per cent of total employment.

According to some estimates, more than 75 per cent of the Tunisian private sector is composed of SMEs with fewer than 100 employees.

¹⁶ Stevenson, 2010, pp. 81-82.

In the United Arab Emirates, the non-oil sector contributes over 60 per cent of GDP and most SMEs are concentrated in the trading sector, which contributes 16 per cent of the non-oil share. The service sector contributes almost 40 per cent of non-oil GDP and the bulk of the SMEs are in transport, storage, and communications, followed by contracting.

B. ROLE OF GREEN SMEs IN SUSTAINABLE DEVELOPMENT

The development of green SMEs in the Arab region can have a direct impact on the three pillars of sustainable development as described below.

1. *The economic pillar*

Green SMEs play a key role in sustainable economic development and there are direct benefits for SMEs that adopt green practices or technologies. Improved environmental performance and efficiency will reduce internal costs, thereby increasing profit. Savings associated with improved environmental performance can be reinvested in the enterprise, which may ultimately create jobs. Through improving the efficiency of production and waste management processes, SMEs will reduce their use of raw materials. Greening can be achieved through technological innovation and upgraded skills. If SMEs create marketable, green innovations, they will benefit from royalties when others use their product.

Increased resource and labour efficiency is a primary benefit of green upgrades, and SMEs that operate most efficiently will have an advantage their direct competitors. Safer working conditions will contribute to higher labour productivity and lower risk of work-related injuries for which the firm may held liable.

Green SMEs can tap into new markets or market niches that were once inaccessible. For example, by obtaining environmental certification or qualifying for eco-labels, an SME can make its product more appealing to consumers who value environmentally friendly products (such as organic agriculture).

At the macro level, green SMEs decrease the vulnerability of developing economies to global commodity price shocks. SMEs promote economic cooperation between the public and private sectors and within the private sector. In addition, SMEs can connect to the value chains of large enterprises, thus contributing to their productive activities. Such synergies can help Arab economies react to financial crises and negative economic phases. In addition, robust local-level economic activity, particularly in rural and remote areas, can alleviate global and regional economic pressure. In this way, SMEs decrease the incidence of external shocks, thereby contributing to the long-term economic sustainability of regional economies.¹⁷

2. *The social pillar*

The special linkage between unemployment and the green economy in the Arab region must be emphasized further, as efforts to transition towards a green economy should ideally target poverty reduction and job creation particularly for women (box 10) and youth.

Concerning informal sector activities, improving working conditions and creating a safer working environment is an important aspect of greening. The transition from the informal to the formal sector can be achieved by wisely using the productive capacity of the poor. The entrepreneurship of marginalized groups can be encouraged through the effective use of unskilled labour and improved access to skill and technology upgrades, particularly for rural non-agricultural SMEs. Green SMEs can be developed by formalizing currently informal economic activities that are often carried on by women and youth. Formalizing those activities will contribute to gender equality in the region, and may lead to expanded operations and productivity, and reduced use of environmentally destructive inputs.

¹⁷ UNIDO, 2011, p. 13.

Box 10. The role of women in the green economy

The green economy in many developed countries benefited from the environmental components of their 2009 stimulus packages. They pledged US\$2 trillion in spending to stabilize their economies, and 24 per cent of those funds were allocated to green projects. Renewable energy, transport infrastructure, auto companies and green buildings and factories are the sectors that benefited most from the stimulus package.

Unfortunately, those green growth opportunities may widen income and gender gaps. The stimulus packages is expected to create 50 million green jobs worldwide in the next 20 years, but about 75 per cent of those jobs will be related to renewable energy and green buildings, sectors where women make up less than 6 per cent of technical staff, less than 1 per cent of top managers and hold less than 9 per cent of construction jobs.

Governments must ensure the social sustainability of the green economy by giving preference to women and other disadvantaged groups, otherwise the transition to a green economy will reinforce gender imbalance in major economic sectors. Green public procurement, for example, should include quotas requiring employers to hire and train women and should provide funding for non-traditional training. Apprenticeships should include targets for female participation. Governments should facilitate family-friendly practices including child care, flexible work and extended leave in the SMEs.

Source: Stevens, 2009.

In developing countries, the transition from traditional to modern heat sources for cooking has shown the synergy between the three pillars of social development and the green economy. Traditional heat sources emit high levels of greenhouse gasses, and small businesses were key to the transition to more efficient stoves or hot plates. Jobs in small businesses were created to produce and distribute equipment, and use of the equipment helped to reduce harmful emissions.

That example can be replicated in the production of sustainable, locally-sourced building materials for the construction industry. In the agricultural sector, SMEs can apply new green technologies to increase profitability, reduce emissions and decrease their dependence on expensive agricultural inputs.

Energy poverty is an obstacle for sustainable social development in the Arab region, and there is a need for decentralized and clean energy production. SMEs can take a role in developing and marketing renewable energy solutions, which respond to the need for climate change mitigation. Those activities offer considerable economic potential and are likely to create jobs in rural areas. Improved access to modern energy services in rural areas will lead to improved health conditions and a higher standard of living for the poor.

Green SMEs pursue economic development in harmony with the other pillars of sustainable development. Traditional industrial development in the region drove migration and urbanization, and eventually led to the recent social upheaval. By contrast, SMEs create jobs and raise standards of living while strengthening communities and existing social networks.¹⁸

3. The environmental pillar

The environmental impact of industrial production can be estimated through its use of global water and energy resources. The sector uses more energy than any other, currently consuming more than one third of total delivered energy. Manufacturing produces nearly a third of all carbon dioxide emissions and accounts for almost 20 per cent of water use. Less than a quarter of industrial waste is recovered or recycled. Current industrial production systems use materials, water and energy inefficiently. Particularly in developing countries, obsolete and inefficient technologies increase the environmental impact of industrial production. Firms may lack the capacity to adopt environmental management systems.¹⁹

¹⁸ UNIDO, 2011, p. 17.

¹⁹ *Ibid.*, pp. 17-18.

There are opportunities for green SMEs to respond to industrial patterns of waste, inefficiency and pollution. They can promote the principles of sustainable production and consumption to alter the production process so that it uses resources more efficiently and reduces waste. Green SMEs can process waste and other industrial by-products, to recover value or recycle materials.

To achieve sustainable consumption and production, firms should reduce the total environmental impact of their products. To do that, they should improve product design to maximize its usefulness and minimize its environmental impact. To reduce environmental impact, industrial products should be designed to have a longer lifespan and greater functionality. They should be easy to disassemble or recycle. Products that meet those standards are an integral part of sustainable consumption and production because they derive the greatest long-term value from the industrial process.

C. OPPORTUNITIES FOR SMEs IN THE TRANSITION TO THE GREEN ECONOMY

For SMEs, the transition to the green economy entails participation in green sectors that protect the environment or in the development of eco-innovation and new markets (so called “growing the green”). Opportunities include waste and environmental management and the production of solar panels, wind mills, water reuse tanks, or their components. Another pathway for SMEs to participate in the green economy is through the adaptation of existing inefficient and harmful practices to make them more environmentally friendly (so called “greening the brown”). Growing the green and greening the brown apply to a wide range of new and existing industries that are part of the EGS sector. Related opportunities for SMEs in the Arab region are described in the following sections.

1. *Growing the green*

There are many opportunities for green SMEs in the Arab region, particularly in activities directly related to EGS. Green SMEs can be active in manufacturing and installing renewable energy and waste treatment equipment and developing and producing clean technologies. They can recycle, manage, transport and treat waste and wastewater, they can recover materials and control air pollution. Although greening and eco-innovation can take place in any sector, the European Commission has articulated two main categories of green industries: pollution management and resource management (table 5).

TABLE 5. CATEGORIES OF GREEN INDUSTRIES

Pollution management	Resource management
Solid waste management and recycling	Water supply
Waste water treatment	Recycled materials
Air pollution control	Renewable energy production
General public administration	Nature protection
Private environmental management	Eco-construction
Remediation and clean up of soil and groundwater	
Noise and vibration control	
Environmental research and development	
Environmental monitoring and instrumentation	

Source: European Commission Directorate-General for the Environment, 2006, p. 24.

A broader interpretation of green industries includes businesses that have green components or that provide services related to environmental and energy management. For example, green industries may design and implement energy saving projects, enable energy infrastructure outsourcing and provide solutions for energy supply and risk management.

Investment is needed to support the development of EGS in the Arab region. Between 2009 and 2010, the share of venture capital that was captured by clean technology firms in the United States increased by 8

per cent.²⁰ Continued large-scale investment could lead to a greater share of EGS in global trade and trade in the Arab region.

Government support is needed to encourage investment and accelerate the entry of SMEs into green sectors. To do that, Governments can offer financial incentives for green industries, privatize public programmes and enact policies to discourage inefficient products or practices. By implementing demand-side measures and appropriate regulations based on industry best practice, Governments can provide incentives for SMEs to adopt eco-innovations.

Government procurement can improve the brand visibility and reputation of new green products and services. Governments can use the public procurement process to match demand and supply. At the same time, public procurement must be transparent and competitive, with a minimum of administrative obstacles for entrepreneurs. In addition, privatization is increasingly seen as a pathway to enhance SME involvement in EGS in the Arab region. Such initiatives open the market to dynamic SMEs.

Governments can facilitate commercial opportunities for green SMEs by pricing negative environmental externalities into the market through taxes, fees, levies, cap-and-trade schemes or tradable permits, and through regulations that target environmental issues, such as energy efficiency, waste disposal or water treatment. As a case in point, many Governments around the world have implemented measures to curb or ban the use of incandescent light bulbs in favour of more energy efficient alternatives. Australia has enacted energy efficiency standards which effectively prohibit the sale of incandescent bulbs after 2010, and all member States of the European Union have agreed to progressively phase them out by 2012. The measure is expected to rapidly change consumer behaviour, open new markets to firms and spur innovation.

The rising of cost of traditional energy can provide an incentive for the development of green markets. Indeed, cost saving is a key driver for the adoption of greener technologies and processes. Green markets can also be strengthened when consumer purchasing patterns favour eco-labelled and certified goods, which can give a product a competitive advantage.

Suggested indicators of SMEs “growing the green”	
OECD Green Growth Indicators (Local):	Employment opportunities in EGS and Turnover of EGS business
National Statistics Accounts:	New EGS sectors providers
Standards and business statistics:	Statistics nomenclature

2. *Greening the brown*

SMEs can reduce the environmental impact of processes and products, known as “greening the brown” by doing the following:

(a) Improving production efficiency: optimizing the productive use of natural resources, in particular energy and water (case study 13);

(b) Enhancing environmental performance: reducing waste and emissions and managing residual wastes in an environmentally sound way;

(c) Minimizing health risks: reducing harmful emissions, and providing goods and services that support the reduction of environmental emissions.²¹

²⁰ PricewaterhouseCoopers, 2011, p. 3. Five of the top 10 United States venture capital deals went to clean technology. Funding in the sector accounted for 17 per cent of all venture capital dollars in 2010 compared to 11 per cent in 2009.

²¹ UNIDO, 2011, p. 8.

Some believe that the main responsibility for pollution lies with big companies, but SMEs can also exert considerable pressure on the environment. Box 11 illustrates how SMEs can monitor their water use to improve efficiency and productivity.

Box 11. Monitoring SME water use

SMEs have different options to monitor water accounting processes. Some develop their own proprietary tools to measure and monitor their water performance, other use publicly-available methodologies such as the Water Footprint Assessment, Life Cycle Assessment and the Global Water Tool of the World Business Council for Sustainable Development. The first two are used to understand the internal water use of an SME and the social and environmental impacts associated with water use and wastewater discharge, while the Global Water Tool aims to identify which facilities might be more adaptable to minimize the water risks based on local water scarcity.

During the accounting process, companies collect many different types of information, including the relative water use and water-use efficiency of products, manufacturing processes, suppliers and value-chain segments or relative water stress. The data allow SMEs to assess operational efficiency and strive for more sustainable product design, to assess and manage the environmental and social impacts of water use and wastewater discharge and risks associated with catchment conditions.

Another water-efficiency tool that can help SMEs achieve a sustainable use of water on-site is the Alliance for Water Stewardship, a voluntary standard of good management practices that complement legal measures which together contribute to sustainable water management at the river-basin scale. The strength of such a voluntary environmental scheme lies in collecting and serving multiple interests to benefit from more flexible regulation, lower administrative burdens and superior environmental performance.

The Alliance for Water Stewardship is currently developing a global certification standard that encourages and incentivizes corporate water management. The standard will apply at the facility and river-basin level and will target agriculture, industry, and water service providers. In addition to the certification standard, the alliance is developing a verification process to ensure that company claims are credible and beneficial.

Source: UNEP, 2012b, pp. 71-72.

SMEs involved in greening their operations and production can contribute to economic growth that is also environmentally sustainable, and decoupled from resource use and pollution. The concept of 'decoupling' entails breaking the link between production and resource use and pollution (box 12).

Box 12. Decoupling

There are two types of decoupling: relative, in which production rises but increases in resource use and pollution do not rise as quickly; and absolute, in which production is able to increase while resource use and pollution fall (ibid.). It is also important to distinguish between resource and impact decoupling, since it is possible to decouple pollution from production but not from resource use; or to decouple resource use from production, but not from pollution. The decoupling discussed here will be in terms of both resource use and impacts. There has been much debate about if and how decoupling can be achieved. While relative decoupling is readily achievable via gradual increases to resource productivity, increased value creation and shifts toward less resource-intensive economic activities; absolute decoupling could require changes to both how economic growth is defined and measured, and in how needs and wants are satisfied. This could include radical changes in terms of technology, production and consumption systems, and culture.

Absolute decoupling – so-called 'green growth' – is obviously most desirable, since it would allow for reduced pollution and resource use and increased production.

Box 12 (continued)

However, despite some progress in this area, no country in the world has achieved a sustainable situation in which high resource productivity and high levels of social and human development are combined with low or falling per capita resource consumption. While considerable technology-driven increases in efficiency are constantly being realized, the gains have always failed to translate into absolute decoupling because they have been outpaced by the growth of economic output and population. It is the interaction of the three variables (output, population and resource efficiency) that determines the degree to which decoupling occurs. Populations are expected to continue to grow for the foreseeable future in the developing world, so there is little that can be done on that front. Therefore, it falls to output and efficiency to deliver absolute decoupling.

Source: UNIDO, 2011, pp. 10-11.

Suggested indicators of SMEs “greening the brown”

UNIDO RECP Indicators

Environmental Certification: Number of environmentally certified SMEs

OECD Manufacturing Toolkit

National Environmental Accounts: Water and Energy

3. Manufacture of environmental goods and provision of services

In 2011, ESCWA analysed the potential of EGS subsectors in its member countries to identify specific areas in which SMEs could develop.²² Each sector was evaluated in terms of its potential to positively impact environmental problems and to achieve MDGs. The evaluation also considered the potential for export beyond the region.

The evaluation showed that the subsectors with the greatest potential are as follows: solar and wind power; natural resource-related activities; water management and waste-water treatment; waste management, recovery and recycling; green agricultural products; green transport; and green building technology. Opportunities for green SMEs in each of those subsectors are described below. In addition, many case studies illustrate initiatives in EGS subsectors in the region.

(a) *Solar and wind power*

One of the main success drivers for the development of green entrepreneurship in the energy sector is the regulatory framework. Additional fiscal incentives and investment subsidies were introduced in 2004 in. The measures were crucial to the growth of the market for solar water heaters, from 7,500 m² of installed solar collectors in 2004 to 81,000 m² in 2010.²³ The composition of the energy conservation sector in Tunisia is described in box 13.

Box 13. The energy conservation sector in Tunisia

According to the Regional Activity Centre for Cleaner Production in Tunisia, the energy conservation sector contributed significantly to the creation of green businesses in the country. Currently, the sector includes 392 companies working in different branches from auditing to the production of solar water heaters, photovoltaics, insulation and compact fluorescent lamps.

²² ESCWA, 2011, pp 15-16. The analysis was based on the membership of ESCWA at the time of the study.

²³ Regional Activity Centre for Cleaner Production, 2011, p. 13.

Box 13 (continued)

In the energy conservation sector, 56 per cent of businesses are consulting firms that primarily conduct energy-saving audits. Companies working with solar water heaters (12 per cent), photovoltaics (18 per cent), insulation (8 per cent) and compact fluorescent lamps (6 per cent) have registered a significant growth in recent years due to increased market demand.

In terms of employment, private energy conservation companies provide a total of 2,389 permanent jobs. Most of them are concentrated in solar water heaters (60 per cent) and energy efficiency in building (24 per cent). Although energy efficiency in building has a high capacity to create employment opportunities, it remains underexploited in Tunisia due to the lack of financial incentives to end users. The renewable energy sector is a high employability subsector in Tunisia that employs 61 per cent of the total employees in the energy conservation sector, compared with 28 per cent in the energy efficiency sub sector and 11 per cent in auditing and consulting.

Source: Regional Activity Centre for Cleaner Production, 2011, p. 47.

Arab SMEs can produce solar and wind energy to meet the demand for energy in the region. The market for renewable energy includes residents of rural areas that are not covered by the national grid and the national grid itself, which would benefit from additional electrical capacity. There are opportunities for SMEs in manufacturing, installing and servicing equipment needed to produce, store and transmit renewable energy. Furthermore, SMEs can play an important role in the geothermal sector (box 14).

Box 14. MENA Geothermal and Investment Company Ltd.

MENA Geothermal is a Palestine-based company, created in 2008 by Khaled Al Sabawi, and is the first licensed geothermal company in the region. The company and its founder have already won several awards for their activities. In August, 2012, the company completed the largest geothermal heating and cooling system in the MENA region, built at the American University of Madaba in Jordan. It features a total cooling load of 1.6 MW and heating load of 1.5 MW, and is expected to save the equivalent of 200,000 kWh of electricity consumption per year. Its carbon dioxide emissions are 47 per cent lower than conventional systems.

The construction of the system began in July 2010, and employed only local labourers and Palestinian engineering and support staff. The large number of administrative procedures and permissions required throughout the process slowed down construction. Al Sabawi now anticipates a growing demand within Jordan, following this success. His company is currently working on a large residential project in Amman.

Sources: <http://www.greenprophet.com/2012/10/mena-geothermal-jordan-aum/> and <http://www.menageothermal.com/index.php?TemplateId=2&ProjectId=2>.

(b) *Natural resource-related activities*

Arab SMEs can seize opportunities in the areas of fibre and fuel, genetically modified plants, services related to education and recreation. They can improve the use of deciduous trees and native timber to ensure sustainability.²⁴

Eco-tourism can play an important role in raising awareness and preserving the environment. There are many opportunities for SME that include developing eco-lodges and other aspects of hospitality; organizing and administering activities that interpret the landscape such as hiking; guiding nature and horticultural tours; enabling specialist activities such as scuba-diving and rock-climbing; producing and selling crafts; and providing educational services.

²⁴ ESCWA, 2011, p. 24. The full list included pollination, seed dispersal, climate regulation, pest regulation, disease regulation, natural hazard protection, erosion regulation, water purification and fresh water production, provision of habitats, nutrient cycling, soil formation and retention, production of atmospheric oxygen, water cycling.

(c) *Water management and waste-water treatment*

Water scarcity in the region is a significant issue, and there is a need for many products and services related to monitoring and protecting water resources and treating wastewater. Domestic and industrial wastewater must be treated properly to prevent the contamination of groundwater. In some ESCWA member countries, additional treatment facilities are needed. Through the use of sustainable technologies, a new wastewater treatment facility in Bahrain has promoted green SMEs and will protect the environment (box 15).

SMEs can offer a variety of support services to water and sanitation utilities and service providers, especially within the scope of public private partnerships. Public utilities can outsource administrative and technical activities to SMEs. Activities such as meter readings, tariff collection, equipment maintenance, and water sampling and analysis can be carried out by SMEs. They can also manage treatment plans, water production and distribution. In addition, there may be opportunities for SMEs in desalination and water harvesting.

Box 15. Bahrain to build an eco-friendly sewage treatment plant

The Arab Shipping and Repair Yard invested US\$2.3 million in May 2012 to build an eco-friendly sewage treatment plant. The plant will be the first in Bahrain to use a highly sustainable organic reed-bed treatment system to recycle the majority of shipyard sewage, according to the chief executive Chris Potter. He added that “as one of the region’s most active industrial complexes, a commitment to sustainable best practice has become an integral part of the company’s strategy”.

“The technology used in the plant is an advanced high-rate wastewater treatment mechanism known as a Moving Bed Biofilm Reactor, coupled with an organic process known as reed-bed treatment”.

The project’s realisation manager Adel Boutari explained that “this method, never used in Bahrain before, has the primary benefit over other sewage treatment systems of being completely sustainable; it uses no chemicals, has very low carbon footprint, produces zero noise or odour, beautifies the local area and has a zero hazard rating. In addition, it is low-maintenance, operates year-round and is cost-effective”. The company has already built a marine sludge treatment facility to recycle sludge removed from crude oil carriers, and distributed plants during the World Environment Day organized under the slogan “Green Economy”.

Sources: http://www.khaleejtimes.com/displayarticle.asp?xfile=data/middleeast/2012/September/middleeast_September_210.xml§ion=middleeast&col.

In addition to effective management of water supply and sanitation, SMEs can contribute to efficient water use. Box 16 highlights one example of resource-efficient crop cultivation in Lebanon.

Box 16. Water efficiency for zatar production in Lebanon

Zatar (thyme) seedlings are particularly delicate cultivations that are sensitive to soil saturation and mould. Manual irrigation of the crop is labour-intensive and requires significant coordination because irrigation cycles may run as frequently as every 15 minutes. An integrated and automated irrigation system reduced the labour intensity and the risk of human error.

ESCWA procured appropriate goods and services from a Lebanese SME in February 2006 to support the establishment of a nursery in a greenhouse with a water-efficient sprinkler system for propagating zatar seedlings. Components include an electrical centrifugal water pump operating at 1.0 HP (monophase), a pressure tank with a pressure switch and waterproof connectors and electric cables. The system has a back-up uninterruptible power supply (220 volts/1100 watt) to ensure the proper functioning of the timer and water pump during power failures. Other electrical components include control cables and waterproof connectors. The water tank has a capacity of 2,000 litres, and 160 microsprayers are suspended by steel cables from the top of the greenhouse to ensure even and efficient distribution of water during irrigation. Check valves ensure that the irrigation network does not drip, preventing waste and the over-saturation of the soil.

The installation of the irrigation system was completed on 5 March 2006.

Source: ESCWA, 2011, p. 19.

(d) *Waste management, recovery and recycling*

In the Arab region, a number of steps could be taken to improve waste management. Efforts could be made to reduce waste, encourage at-source separation and to recycle materials. Currently, households have few incentives to separate waste and SMEs could lead the way in raising public awareness of waste management in the region. In addition, SMEs can develop products and packaging that generates less waste or are more environmentally friendly (box 17).

Box 17. Green plastic use in Lebanon

Plastics are strong, durable, lightweight, and are the most cost-effective materials for packaging applications. Although many plastic products are recycled and reused, unfortunately many end up in the environment on land or at sea where they remain for many years. Over the last decade, businesses, consumers and Governments have sought to minimize the impact of plastic on the environment. A new technology, d2w™ oxo-biodegradable plastics, has been developed to achieve that objective, and in 2009, a pioneering SME introduced the technology to Lebanon.

To create d2w™ oxo-biodegradable plastics, ordinary plastic is converted at the end of its service-life into a material with a completely different molecular structure that can be safely bio-assimilated in the open environment in the same way as a leaf and therefore causes no harm to the ecosystem.

Sources: <http://degradable.net/d2w-controlledlife-plastic/what-is-d2w/> and <http://www.indiawaterportal.org/articles/bagtree-zero-waste-campaign-against-use-plastic-organised-thanal-and-zero-waste-centre>.

E-waste initiatives have taken place in the Arab region. Some have been promoted by NGOs and others have been publicly led (such as the Green IC initiative in Egypt, the temporary e-waste disposal facility of 2007 in the Syrian Arab Republic and the proposed project for compiling an e-waste inventory in 2011). Business opportunities for SMEs in the e-waste sector range from metal recovery to recycling and refurbishment. In OECD countries, e-waste disposal regulations were enacted to internalize the cost of disposal into the purchase price of new devices. Higher costs led to the creation of new SMEs that refurbished and certified used components, and sold them at a lower price than new ones.

(e) *Green agricultural products*

Throughout the agricultural sector, there is a need to increase productivity while reducing costs, resource use and waste. Opportunities for SMEs in green agriculture are similar to the opportunities for traditional agriculture. SMEs can help the sector to improve efficiency through the installation and use of monitoring systems (including satellite technology) to gauge productivity. SMEs can also contribute to the operation and maintenance of machinery, irrigation technology, greenhouses and silos.

Green SMEs in the organic agriculture sector can benefit greatly from appropriate laws. In Tunisia, a law on organic agriculture was adopted in 1996 and the Technical Centre for Biological Agriculture was created to build capacity and support organic farming (box 18).

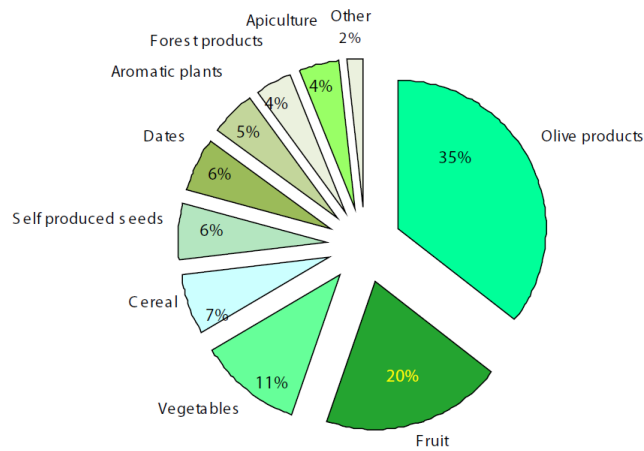
Box 18. Organic agriculture in Tunisia

In Tunisia in 2011, an estimated 330,000 ha were devoted to organic farming, corresponding to 6.6 per cent of the country's arable land. Out of the 167 companies and farms working in organic agriculture, 35 per cent produce olives and olive oil, a traditional product.

The increasing demand for organic products for export to neighbouring European markets and competitive prices are important drivers that boost the country's organic farming sector. Thus, 27 per cent of the organic farms reserve their certified products for export to Europe. Recently, new organic products such as jojoba, sugar and cactus have been introduced in response to increasing demand from Europe.

Box 18 (continued)

Distribution of Tunisian organic produce



Source: Regional Activity Centre for Cleaner Production, 2011, pp. 53-54.

(f) *Green transport*

High levels of air pollution, noise and congestion are the symptoms of unsustainable transportation networks. Some developing countries have launched projects for public transportation, which can be an important source of business for SMEs. There are many green transport initiatives that can involve SMEs, such as the conversion of vehicles to natural gas and compulsory periodic vehicle testing.

Many Arab countries have established regular vehicle emission testing and engine tuning programmes, and those programmes have created business opportunities for local SMEs. Those opportunities also provide environmental benefits by reducing fuel consumption and vehicle emissions and extending vehicle life. Proper maintenance of vehicles can reduce air pollution by as much 30 per cent.

In 1999, a programme in Egypt began by testing 13,000 vehicles in Cairo and revealed that 34 per cent of vehicles did not meet emission standards. In that case, engine tuning resulted in an average emission reduction of 62 per cent for carbon monoxide and 35 per cent for hydrocarbon. In addition, after engine tuning, the vehicle consumed 15 per cent less fuel.²⁵

(g) *Green building technology*

Increased costs of energy, building materials, higher regulatory standards and greater consumer interest are driving the expansion of the green building market in many countries, although the trend in the Arab region is not yet widespread. New housing and even new cities are being developed in the United Arab Emirates and Saudi Arabia. The private sector also has some leading players in green technology.

D. CHALLENGES FOR GREEN SMES

1. Macro level

Throughout the Arab region, there are four main environmental challenges caused by climate change: energy security; food security; water security; and desertification and land degradation. Environmental challenges have a significant impact on resources and economic activity.

²⁵ ESCWA, 2011, p. 20.

Another challenge is that the macroeconomic environment has generally been unfavourable, and there are various legal and institutional constraints on small businesses. In developing countries there is a great need for technology transfer and capacity building. In the outcome document of the Rio+20 conference, world leaders called upon United Nations agencies to assess the needs in developing countries and identify options for a facilitation mechanism to promote the development and dissemination of clean technologies. More work in that area is needed in the Arab region, and much depends on the support of public institutions and research centres operating in networks with advanced countries.

In addition, some Arab countries have been impacted by social movements that began in 2011. Those developments highlighted the needs of the ever-growing youth population, particularly the need for employment. Leaders throughout the region have attempted to find solutions to that challenge, but economic challenges have been exacerbated by the general sense of instability following recent social movements. In Libya and other countries in transition, SMEs in the private sector have great potential for development but they lack private equity investments (box 19). Investors are waiting for the political situation to stabilize before they act. Moreover, entrepreneurs may also prefer to avoid the risks of doing business in a country undergoing political transition, and may opt for economic migration.

Box 19. SMEs in Libya

For the private sector of Libya, SMEs have the potential to become the main growth engine. Libyan SMEs are predominantly located in the regions of Benghazi, Jebel Akhdar and Al-Marqab and are mainly engaged in food processing and the preparation of wood and metal for the construction industry. In addition, they are active in the garment industry, grain milling and processing, ceramics and bricks, and publishing. Other areas of opportunity for SMEs include leather production, fisheries and tourism (hospitality and the production of souvenirs).

The Libyan economy is highly dependent on the oil and gas sector and the public sector is a significant employer. If exports of fish and dates are excluded, the value added contribution and growth performance of private SMEs in non-oil sectors have been relatively low. In addition to the recurrent problems of economies of scale, Libyan SMEs lack business know-how and are characterized by poor managerial, financial and marketing capability. Other challenges include transaction and start-up costs and a regulatory framework that obstructs the creation of SMEs despite low business taxes. In addition, the culture of entrepreneurship is weak.

Libyan SMEs would benefit from linking with larger national and multinational enterprises, to operate as suppliers in oil value chains. They could also work to develop higher technology industrial clusters in non-oil sectors.

Source: African Development Bank, 2010, pp. 2-3.

Green SMEs need institutional support from Governments, associations and other stakeholders to operate and develop. There may be resistance to such support in the Arab region because such institutions may not be able to address the new green challenges or they may simply be over-burdened with other issues. Political will may be insufficient to support green SMEs.

The development of green SMEs promotes the long-term best interests of the industrial sector as a whole, nevertheless, the industrial sector may feel threatened by the green transition and may even lobby against it. Similarly, trade unions may perceive jobs to be threatened by the green transition. Active institutional and industrial support can help overcome those challenges.

Moreover, SMEs in the Arab region have to compete against State-owned and administered enterprises, characterized by large-scale development supported by foreign direct investment. In previous decades, Governments aimed to accelerate technology transfer, improve access to markets (particularly international markets) and attract capital inflows. As such, they played a dominant role in defining long-

term strategic priorities, which were largely based on import substitution. That model severely hindered the development of local SMEs because it prevented them from supplying goods and services to other businesses, an area in which SMEs tend to thrive.

The expansion of SMEs is constrained by the importance of non-economic criteria within domestic markets such as ethnicity, clan or religious affiliation or family connections.

2. *Micro level*

In Arab countries, SMEs face significant challenges that limit their potential for growth. Moving to a green economy may be more difficult for SMEs than for large firms because of resource constraints and a deficit of knowledge and skills. In the aftermath of the global financial crisis, SMEs may be more concerned with basic survival. Some of the challenges to SMEs in the region are outlined in this section.

(a) *Skills and knowledge*

As countries make the transition to a green economy, jobs will change and new skills will be required. Those changes will be driven by the need for innovation and increased competitiveness. Jobs will also change in response to policies and regulations designed to adapt to climate change. If SMEs do not understand the benefits of green opportunities or new technologies, they are unlikely to take advantage them, and they will miss out on improved efficiency and decreased costs.

(b) *Regulatory environment*

SMEs may see regulations as threats or as obstacles they are powerless to overcome. Although regulation can be a powerful driver of change, regulatory reforms imply burdens on SMEs being generally short of the competences required for monitoring a fast changing the regulatory environment can also obstruct the growth of SMEs if the regulations change too quickly or if SMEs are unable to understand the restrictions or requirements.

(c) *Finance*

The involvement of SMEs in green sectors or activities usually requires up-front costs, and significant investments are often needed for businesses to acquire and install new technologies, implement organizational changes, measure progress, and continue monitoring environmental performance. Most SMEs do not have sufficient resources to identify and implement green solutions. Furthermore, few SMEs have substantial assets or collateral, which means that banks or credit institutions may refuse to lend to them. Thus, financial constraints limit innovative green entrepreneurship and the capacity of SMEs to adopt new technology.

(d) *Transnational supply chains*

The global dimension of the transition to the green economy has created new opportunities for SMEs to participate in international markets. However, SMEs must overcome barriers related to resources, competency and access to finance to take advantage of those opportunities. Indeed, responding to green requirements is of growing importance for SMEs that participate in global value chains. Many larger companies now realize that customers and other stakeholders do not distinguish between a company and its suppliers or business partners. Large companies are held accountable for both the labour practices and the environmental impact of their suppliers. The requirements of green-related changes in transnational supply chains can be particularly challenging for SMEs. To access global markets, they must fulfil highly demanding quality standards, while facing growing pressures to reduce costs. Nevertheless, if SMEs are able to rise to that challenge, they reap the rewards of enhanced access to global markets. It is important to

note, however, that micro and small enterprises that constitute the largest share of SMEs in the Arab region are generally excluded from such relationships and contracts.

(e) *Market and policy failures*

In some cases, discriminatory policies favour large or well-connected firms. Market failures, as in the case of externalities or market distortions such as subsidies to fossil-fuel industries, can constitute a barrier to the development of green SMEs that can neutralize other measures to support them (such as financing or training). In addition, SMEs may suffer if their products must compete in a market with low-priced goods that may have been imported illegally.

(f) *Competitiveness of green products*

In some niche markets, consumers, often labelled as “elites”, are willing to pay higher prices for environmentally friendly products, organic agriculture goods and eco-labelled items. Yet a large portion of the society may perceive green products to be more expensive without being substantially different. Unless consumers understand the value and benefits of green products, SMEs are unlikely to overcome that challenge, and green products will fail to compete with less sustainable alternatives.

(g) *Awareness*

A significant hindrance to the development of green SMEs is that they are often unaware of their environmental impact or the laws and regulations that affect them. In addition, SMEs may be sceptical of the economic benefits of greening. They may also believe that environmental management is not part of their core business, which has a strong negative effect on their environmental sustainability.

(h) *Access to specialized services*

National or regional programmes to support the development of green SMEs may not have the resources to reach every enterprise or to reach those that are very small. In addition, the capacity of SMEs to adopt new or improved environmental solutions also depends on their access to specialized services.

V. POLICY OPTIONS FOR THE ARAB REGION

The public sector has a vital role to play in triggering the transformation and catalysing the required flow of private finance. Public resources are significantly smaller than those of private markets, but developing countries have limited access to private capital. That is why a mix of policies and measures must be tailored to the needs and preferences of each country. Policy options include regulations, investment in green infrastructure, financial incentives, subsidy reform, sustainable public procurement, information disclosure and voluntary partnerships. Public spending should focus primarily on specific public goods such as access to water and sanitation, protection of biodiversity and alleviation of poverty.

National and local authorities can significantly accelerate the development of the private sector in green growth areas. To aid the transition, flexible policies and initiatives must be adjusted to the local markets where SMEs operate and where green skills and human capital can be developed. The workforce of the Arab region can be tuned to green skills and green entrepreneurship.

The transition to the green economy requires the decoupling of economic growth from non-renewable natural resources. Decoupling is a major challenge, yet it is an essential aspect of long-term sustainability. The Arab Regional Preparatory Meeting for Rio+20 called for a mix of “sustainable public procurement, environmental taxation, green investment incentives and green financing” to foster a gradual transition to a green economy. Moreover, legal and institutional frameworks should be set up to encourage investments in new technologies, while earmarking funds for environment-related projects in national budgets.

This chapter presents policy options to support the transition to the green economy, the development of indicators for monitoring progress and to support green SMEs. A summary of the policies outlined below is annexed to this study.

A. SUPPORTING THE TRANSITION TO THE GREEN ECONOMY

A transition to a green economy will require specific enabling conditions consisting of the backdrop of national regulations, policies, subsidies and incentives, international market and legal infrastructure and trade and aid protocols. Key enabling conditions include the following:

- Establishing sound regulatory frameworks;
- Prioritizing Government investment and spending in areas that stimulate the greening of economic sectors;
- Limiting spending in areas that deplete natural capital;
- Employing taxes and market-based instruments to shift consumer preference and promote green investment and innovation;
- Investing in capacity-building and training;
- Strengthening international governance.

Incentives

Governments can use price signals to guide the behaviour of market participants. Economic incentives include pollution charge systems (taxes and fees), tradable permits, deposit refund systems, reduction of market barriers and phasing out of harmful subsidies.

To support the transition, Governments must review the impact of public policies on patterns of production, consumption, purchasing and investment. Subsidies and Distortive incentives must be eliminated before efficient and productive green economy infrastructures can be created.

While green growth strategies will be articulated primarily at the national level, international and local dimensions should be fully considered. International cooperation and coordination are needed to ensure that policies are effective and to avoid green protectionism or competitiveness losses. This is particularly the case for global environmental challenges such as climate change and the protection of biodiversity.

A green economy approach advocates the adoption of integrated policymaking, which requires Governments to assess policy trade-offs and identify synergies across the three dimensions of sustainable development and across sectors. The lack of an integrated approach to policy formulation and implementation has prevented countries from achieving sustainable development. The formulation of green economy policies must overcome that failure. Furthermore, policymakers must consider the regulatory burden on SMEs, and make every effort to minimize it.

Arab Governments should prioritize new eco-agricultural methods to protect soil, land and water, such as organic and conservation farming methods. These practices will increase the agricultural share in the productive labour force, improve living standards and limit rural to urban migration.

In the water sector, Arab countries must enact policies that control and regulate access, promote irrigation and water use efficiency, prevent pollution and protect areas that are vital to water resources.

A mix of regulatory standards and economic incentives are needed to provide sustained investment in energy efficiency and in renewable energy sources. Arab countries should develop low-carbon industrial development strategies motivated by the opportunity to make their economies more energy efficient and to enhance local industrial competitiveness, income diversification and job creation. Table 6 outlines existing targets for the share of renewable energy in selected Arab countries.

TABLE 6. TARGETS FOR RENEWABLE ENERGY SHARE IN SELECTED ARAB COUNTRIES

Country	Year	Target
Algeria	2030	10 per cent from electrical energy
Egypt	2020	20 per cent from electrical energy
Jordan	2020	10 per cent from primary energy
Kuwait	2020	5 per cent from electrical energy
Lebanon	2020	12 per cent from electrical energy
Libya	2020	10 per cent from electrical energy
Libya	2030	25 per cent from electrical energy
Morocco	2020	42 per cent from electrical energy
Sudan	2011	1 per cent from electrical energy
Syrian Arab Republic	2030	4.3 per cent from primary energy
Tunisia	2014	4.3 per cent from primary energy
United Arab Emirates	2030	7 per cent from electrical energy

Source: League of Arab States.

Feed-in tariffs and tax exemptions for early adopters can promote a gradual shift to renewable energy sources. Regulatory standards and economic incentives can encourage investments in energy efficiency investments in buildings, manufacturing and transportation. Furthermore, regulatory authorities should mandate efficiency standards for electric appliances, equipment and lighting in homes, commercial buildings and industrial facilities.

Green transport initiatives in the region are urgently needed to respond to population growth, increasing urbanization and rising fuel costs. Given the rapidly growing number of vehicles and the large share of the transportation sector in energy consumption, Arab Governments must mandate fuel economy standards to reduce the demand for fuel. Policies in favour of mass transit systems should also be established. Such policy interventions have a relatively low cost while yielding high economic, social and environmental dividends within a short period of time.

In some Arab countries, there are Government initiatives to promote green building practices. Nevertheless, there are still barriers such as higher costs and the lack of technical expertise. Building efficiency codes and standards are the most effective institutional levers to guide construction practices.

Codes should set minimum requirements for energy efficiency to reduce energy use and emissions over the lifetime of the building. A holistic design approach is needed that incorporates environmental principles in the form, materials, design, equipment installation and other aspects of construction. Such an approach will yield the highest energy efficiency gains.

During the past decade, all ESCWA member countries have taken steps at the policy, legal, institutional operational and financial levels to improve solid waste management. Although some progress has been made, more must be done to overcome persistent problems. There is an urgent need to abandon waste dumping, burning, and/or land filling, and to adopt a resource management approach to capture value from waste materials through reuse, recycling and recovery. More can be done to reduce the amount of waste that is generated and to increase the share of recyclable materials. Governments can provide incentives to firms that reduce waste and use materials that have lower environmental impact.

In addition, proper management of e-waste and hazardous industrial or medical waste is an area of growing concern. Special processes are required to store and dispose of such waste to protect the environment and the population from harm. Governments must monitor and regulate those processes to ensure compliance and safety.

B. SUPPORTING THE DEVELOPMENT OF INDICATORS TO MONITOR THE TRANSITION TO THE GREEN ECONOMY

Putting in place a monitoring framework is an integral component of any green growth strategy. In Arab countries, one of the biggest obstacles to establishing a monitoring framework for green growth is the overall statistical capacity. Faced with other pressing priorities, Arab countries have experienced difficulties in mobilizing the capacity and resources to collect, produce, analyse and disseminate relevant information to support policy development.

For developing countries, compiling a set of indicators to monitor progress on green growth need not increase the statistical burden if synergies are maximized. When developing and implementing indicators it is important to use a pragmatic approach and to recognize that there is no universal set. Whatever set of indicators is used, some flexibility is needed to periodically refine them to account for changes in scientific advancements, policy concerns and data availability.

Because there are many potential indicators, a good understanding of the purpose for which they are to be used is needed. Agreed criteria must be applied to guide and validate indicators. Decision makers should consider the following questions: What are the indicators supposed to measure? How and by whom will they be used? How solid is the information base on which the indicators rely?

When used in international or regional work, consistency between indicators is required. Criteria for selecting environmental indicators cover such factors as responsiveness, reliability, ease of interpretation, simplicity, scientific validity, data availability, comparability over time and space. They must be structured around three basic criteria: relevance and utility for users and policymakers, analytical soundness and measurability.

It is important to note that the choice of the initial level of an environmental or an economic variable and of the time period considered can affect the interpretation of the results, because countries proceed according to different timetables.

Data collection and validation are important parts of the production of indicators. National laws or international agreements can require the provision of data needed to calculate indicators. Data provision can be part of administrative procedures related to environmental impact assessments, pollution prevention and control, business surveys and so on. It can also be done on a voluntary basis by public authorities and by

private enterprises. What is essential is to provide the right information for the right purpose, while maintaining continuity and regularity in core activities.

Various sets of indicators for monitoring the green economy have been developed by international organizations. Generally, green economy indicators represent three principal areas:

1. Green transformation of key sectors and the economy.
2. Decoupling and efficiency.
3. Aggregate indicators of progress and well-being.

Countries may select the indicators that are of highest priority for them, based on their use of natural resources and their level of economic development. Nevertheless, it is important to keep the integrated approach in mind, so that progress towards a certain priority is not made at the expense of other aspects of the green economy.

Countries differ in terms of the quality and coverage of data production activities, the level of integration of different information sources and the effectiveness of reporting processes. Data gaps in the region often reflect national priorities, which in turn reflect their needs, past experience and activities, and the availability of institutional and financial resources. To ensure that data are useful for decision making, redundancies must be avoided, and data collection must be driven by demand rather than by technology. It is therefore important to improve data quality, and to fill gaps associated with specific issues. Governments can help by applying integrated approaches to information and involving all stakeholders, including enterprises, environmental NGOs, consumer associations and the news media.

Countries also differ in terms of the institutional set-up and the level and type of cooperation between various actors. In many instances the responsibilities of different levels of government is defined by legislation. The following entities are important actors in country-level monitoring of the environment and the transition to the green economy.

National statistical offices are often a main source of basic socioeconomic statistics, and in many countries they also play an increasingly important role in the supply and publication of basic environmental statistics and in the compilation of related indicators.

National ministries of the environment have a primary role and the ministries of the economy, finance, trade, agriculture, energy, transport or industry may each have a role as well, depending on the distribution of responsibilities and the issues involved.

Research institutions and universities can play an important role in environmental monitoring, and in environmental and economic accounting, modelling and forecasting.

Private firms, usually in accordance with the ‘polluter pays’ principle, are also involved in environmental monitoring. They also publish and disseminate non-technical reports. Many businesses produce reports including data of importance to green growth. Chambers of commerce and business associations can play an important role in supporting and coordinating some of those activities.

Whatever the general institutional arrangement, interministerial activities need to be well-coordinated and the related institutional arrangements should be clearly defined. Cooperation is particularly needed when reporting on green growth and sustainable development to support policy integration and discussions in the parliament. In the development of indicators, the use of a multi-stakeholder consultation process involving the Government, businesses and other stakeholders as appropriate, has proven useful in many instances. In other cases, the establishment of a national commission to coordinate the work of several ministries or agencies has been helpful. In the absence of a formal coordination mechanism, it may be a challenge to bring the relevant information together in a coherent format and in a timely manner. It requires

good communication between suppliers and users of information, flexible and cooperative institutional arrangements and partnerships, and implies that priorities are set and resources are allocated accordingly. National statistical offices are best positioned to lead cooperative activities. A statistical coordination committee could be created to manage statistical programming and organize the efforts of all entities involved in collecting and disseminating data.

C. SUPPORTING GREEN SMES

1. *Raising awareness*

To adapt to the anticipated green-led changes, it is critical to raise awareness among SMEs and entrepreneurs and to ensure that they are connected to knowledge networks. Those steps will enhance their active role as producers and users in the green economy.

2. *Reducing uncertainty*

Economic uncertainty negatively impacts the prospects of long-term investments in sustainable practices and eco-innovation. Thus, Governments must take action to provide incentives for new entrants to green markets. Regulations can be designed to strengthen the market for green goods and services, which will establish a greater sense of certainty to encourage investment and entrepreneurship.

3. *Enhancing access to finance*

Access to finance will allow SMEs and entrepreneurs to invest in innovations and adopt sustainable practices and technologies. Governments should prioritize policies to support existing structures, such as the Arab Environment Facility, to promote financing in support to SMEs, research and development, innovative ventures and responsible management. Entrepreneurial start-ups with growth potential can benefit from venture or risk capital funds that invest in technological innovation. Funds that invest in environmental technologies are increasing in the Arab region. Examples include the recently introduced “Green Sukuk” in Saudi Arabia and an Islamic banking model of venture capital in the United Arab Emirates.

The banking system and the public sector should create a system to facilitate the conception of green credit lines even in the absence of collateral to support the implementation of green technologies or the start up of green SMEs. Private equity and venture capital are needed to co-finance green projects.

4. *Supporting skill transformation*

The transition towards a low-carbon economy demands specialized skills and new generations must be educated to meet the changing demand. Innovative green SMEs will integrate new skills and technologies and provide training.

5. *Greening local production and innovation systems*

The transition to a green economy demands broad technological, organizational and cultural changes, which must have strong support at the local level. Governments, universities and public research centres are engaging with SMEs, providing problem-solving and auditing services, and creating networking clusters around green activities. Those efforts should be consolidated and coordinated to improve effectiveness.

6. *Improving access to markets*

Regulatory reforms, standards and public procurement can strengthen emerging green markets, in addition to awareness-raising, eco-labelling and other demand-side measures. Policies should aim to remove barriers to SME participation in green markets and value chains.

7. Fostering entrepreneurship

To accelerate green growth, Arab Governments must arrange a proper environment to promote innovative entrepreneurship, given that new firms are a primary source of radical innovation. Policies should reduce barriers and costs to enter or exit the market. Similarly, SMEs benefit from administrative processes that are simple.

8. Improving regulatory frameworks

Appropriate regulations should aim to organize economic sectors that could impact the environment and the quality of life. Regulations could be general rules that encourage investments or they could focus on the environmental sector specifically. They should ensure that economic development takes all dimensions of sustainable development into account, particularly the participation of women. Regulatory measures must remove barriers that prevent women from starting their own businesses or working in SMEs.

9. Providing incentives

Effective policies that correct market failures and facilitate the entire spectrum of support actions will be essential for the development of green SMEs in the Arab region. Governments can use tax policies to support green SMEs. The most important mechanisms include tax exemptions, tax benefits and exonerations, customs duty reduction and bank loans with reduced interest rates.

In addition, Governments can institute different forms of environmental taxation in the fields of waste management and energy conservation including waste and wastewater disposal taxes, carbon taxes and so on. Revenues can be channelled to national environmental funds. Governments can also offer green incentives, such as lending, technology subsidies, research and development support, and innovative schemes such as payment for environmental services. Such incentives can help correct market failures, encourage private green investments and ensure the short-term survival of green industries.

10. Leveraging green public procurement

Public procurement is an important tool to support green SMEs. Government commitments to purchase green products and services can initiate a virtuous economic circle. Governments can provide critical support sustainable production and consumption by targeting green products in procurement exercises, within existing spending. Energy efficiency measures (such as double glazing and building insulation standards) and renewable energy supply are the main areas impacted by sustainable public procurement.

11. Providing institutional support

Institutions such as SME authorities play a crucial role in promoting the environmental sector and provide stakeholders with technical assistance. Such institutions may be created to interface between enterprises and central Government to ensure that SMEs comply with Government policies.

VI. CONCLUSION

The green economy has been adopted by the international community as an important tool for sustainable development. This study assessed the progress to date in the Arab region in its transition to a green economy and the achievements of different sectors. It has also provided an overview of indicators that can be used to monitor progress towards a green economy and policy options that can be used to support the transition and our capacity to measure it. It aimed to address where within the region, why and how the transition to the green economy is taking place.

The report highlighted and reflected on the importance of indicators and policies that would help monitor and shape the road towards the green economy transition, be it at the economy or the enterprise level. It presented a set of well-developed indicators that can help Governments and enterprises monitor the transition to the green economy at the macro, meso and micro levels. These indicators can help countries to monitor progress towards the green economy, and evaluate their green economy policies. However, key challenges remain in the overall capacity of Arab countries to collect, manage, report and analyse the data necessary for supporting those indicators. The green economy is considered relatively new in the Arab region, and consequently initiatives are scarce and related statistics in short supply. To address the gap, policy options were presented to support institutional capacity in the development of indicators and monitoring of progress.

The Arab region is facing challenges in implementing the green economy, which vary between countries, but include social and political instability, unemployment, poverty eradication, water scarcity, food security and oil dependency. Despite those challenges, the green economy is emerging in different forms in the Arab region, depending on local economic strengths and weaknesses. Policy interventions seem to be most effective when building upon local strengths and goals.

The transition will require a fundamental review and redesign of public policies to stimulate shifts in production, consumption, purchasing and investment patterns. The Government will play a central role in stimulating selected sectors and addressing constraints through investment, regulations, taxes, subsidies, pricing, incentives and other measures. Those measures must be developed in accordance with national circumstances, and likely priority areas include agriculture, water, energy, transport and buildings. Integrated policymaking that assesses policy trade-offs and synergies across economic, social and environmental outcomes will be needed to select and design green economy policies. Integrated policymaking poses a major challenge for Governments.

SMEs play a key role in national economic systems in terms of employment, contribution to GDP, percentage of the private sector companies and other socioeconomic aspects. They have the potential to contribute to poverty eradication to correct inequality and gender imbalance. SMEs are flexible, they can access local markets and resources, and adapt and react to external shocks. They have the potential to turn environmental protection into an opportunity for growth and sustainable development. Evaluating sustainable development and the green economy in the Arab region therefore cannot be done without considering the SME sector, including both those that are Greening the Brown and Growing the Green.

Policy options for supporting green SMEs are needed to address key barriers and challenges in the region, including: raising awareness, reducing uncertainty, enhancing access to finance, supporting skill formation and new business models, improving access to markets, providing fiscal incentives and implementing green taxation.

For the green economy to be effective, a mix of policies and measures must be tailored to the needs and preferences of each country, along with strong political leadership to drive change. Exchanging information and sharing experience can build capacity and establish good practice and ESCWA and other regional organisations have an important role to play in facilitating the exchange.

Annex

SUMMARY OF POLICIES AND INDICATORS

Supporting the transition to the green economy

(a) *Water*

Policy	Indicator
Control and regulation of water access	Proportion of total water resources used
Promotion of irrigation and water use efficiency	Water use intensity by economic activity Proportion of reused water
Prevention of water pollution	* Presence of faecal coliforms in freshwater * Biochemical oxygen demand in water bodies * Proportion of treated waste-water * Pollution load of waste-water (measured in, for example, BOD, COD, nutrient and/or metal load) * Quantity of certain materials in waste-water
Establishment of protection zones vital to water supplies and nature conservation/biodiversity	* Water use intensity by economic activity * Proportion of water from harvested rainwater

(b) *Transport*

Policy	Indicator
Development of low-carbon industrial development strategies	Proportion of renewal energy
Mandatory vehicle fuel economy standards	Quality of fuel used for transportation
Mass public transit systems	* Modal split of passenger transportation * Modal split of freight transport * Energy intensity of transport * Energy consumption of transport relative to GDP
Secondary vehicle fuel efficiency standards	Quality of fuel used for transportation

(c) *Energy*

Policy	Indicator
Efficiency performance standards for electric appliances, equipment and lighting in homes, commercial buildings and industrial facilities	* Proportion of renewal energy * Annual energy consumption, total and by main user category * Share of renewable energy sources in total energy use * Intensity of energy use, total and by economic activity
Shift in the approach to municipal solid waste from waste dumping, burning, and land filling	* Cost of waste treatment per unit of production * Cost of waste-water treatment per unit of production * Revenues from sale of waste * Cost of energy per unit of product * Quantity of product per USD\$1000 of energy costs

(d) *Building*

Policy
Environmental principles in building form, materials, orientation, equipment installations to yield the highest energy and resource efficiency gains
Building efficiency codes and standards (influencing construction practices, minimum requirements for energy and resource efficiency).

Policies to support the development of indicators to monitor of the transition to the green economy

- “Green transformation of key sectors and the economy”: focusing on investments in a green transformation of various sectors of the economy, and their associated share in output and employment. Indicators include investments in a green transformation of various sectors of the economy and the associated share in output and employment.
- “Decoupling and Efficiency”: assessing resource efficiency and productivity, and the decoupling of economic activity from resource use and related environmental impacts, at both sector and economy-wide levels, building on the work of the International Resource Panel.
- “Aggregate indicators of progress and well-being”: referring to various initiatives on overall measures of economic progress and well-being, including poverty alleviation and natural capital depreciation.
- National statistical offices help supply and publish basic environmental statistics and in the compilation of related indicators.
- The role of national ministries depends much on how responsibilities concerning the environment are distributed among ministries, as well as on the issues involved.
- Research institutions and universities play an important role in environmental monitoring, and in environmental and economic accounting, modelling and forecasting.
- Private firms are involved in environmental monitoring, usually in accordance with the polluter pays principle, and in the publication and dissemination of non-technical reports. Many businesses also produce corporate reports including aspects of importance to green growth economy. Chambers of commerce and business associations play an important role in supporting and in coordinating of some of the activities.
- Investments, outputs and jobs in environmental sectors (renewable energy technologies, public transport, waste management and recycling, etc.).

Policies to support green SMEs

- Providing tax breaks for equipment imported and manufactured for the purposes of biogas plant construction.
- Providing electricity purchase prices to producers that at least meet the national cost of electricity generation rather than the subsidized cost.
- Removing energy subsidies that, while having an adverse effect on the poorer population in the short term, will encourage the use of all renewable energies and benefit the community as a whole in the long term.
- Exempting all of the biogas plant operations from taxes for the start-up or duration of the project.
- Implementing stricter environmental laws prohibiting open disposal of solid and liquid wastes from industrial facilities of all types.
- Providing tax incentives or preferential treatment for plants installing organic waste digesters.

- Raising awareness on green-led changes and enhancing roles in the low-carbon economy. Indicators include skills and trainings.
- Reducing uncertainty by designing consistent and predictable regulation and by providing clear market signals.
- Enhancing access to finance and the availability of green financing schemes/Enhancing venture capital markets.
- Supporting skill transformation.
- Supporting the adoption of new business models and modes of provision/cost reduction.
- Enhancing the green focus of local production and innovation systems.
- Improving access to markets by removing barriers to SME participation in expanding global green markets and value chains that are undergoing a transition towards more sustainable practices and business models.
- Fostering entrepreneurship and new firms by reducing entry barriers as well as the costs incurred when exiting markets. Technical advice and administrative simplification are also considered to be very effective in helping SMEs to be greener.
- Regulatory frameworks that aim at organizing economic sectors that could impact the environment and the quality of life.
- Fiscal incentives mechanisms and green taxation. The most important mechanisms being used are tax exemptions, tax benefits, value added tax exonerations, customs duty reduction as well as bank loans with reduced interest rates.
- Purchasing sustainable products and services, and green public procurement can start or drive markets for sustainable production and consumption both at the national and international level.
- Institutional framework ensuring the control of nuisance and providing stakeholders of a given sector with technical assistance. Institutions may be created to have a closer relationship with enterprises while maintaining the link with central Government to ensure proper compliance with policies.

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