

Industry and the Green Economy in North Africa

Challenges, experiences and prospects

Draft Regional Report



United Nations
Economic Commission for Africa
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ABBREVIATIONS

ADEREE	Renewable energy and energy-efficiency development Agency, Morocco
AND	National Waste Management Agency, Algeria
ANME	National Agency for energy management in Tunisia
ANSEJ	National Agency supporting youth employment, Algeria
CEEB	Energy-efficiency law in the construction sector, Morocco
CES	Solar water heater
CO₂	Carbon Dioxide
CSP	Concentrated Solar Energy Panels
EPAP	Egyptian Pollution Abatement Project
FEDEP	National Fund for Environment and Pollution Abatement, Algeria
FNME	National Fund for Energy Management
GEF	Global Environmental Facility
GIDMS	Integrated management of solid municipal waste
HDI	Human development index
LBC	Energy-saving lamp
NREA	New & Renewable Energy Authority
SDG	Sustainable Development Goals
PEEI	Energy-efficiency Programme in the industrial sector in Morocco
GDP	Gross Domestic Product
PNDM	National Programme for Household waste
PNEDS	National Programme for Special Waste disposal
SONELGAZ	National Company for electricity and gas in Algeria
UNECA	United Nations Economic Commission for Africa
JICA	Japan International Cooperation Agency
PNA	National Sanitation Programme
FODEP	Pollution Abatement Fund
ONAS	National Sanitation Office
WHO	World Health Organization
COD	Chemical oxygen demand
BOD	Biological oxygen demand
ANPE	National Agency for Environment Conservation
MATE	Ministry of Spatial planning and Environment
AFD	French Agency for Development
EEAA	Egyptian Environmental Affairs Agency

1 - Introduction

1.1 Context of the study

One of the major challenges facing the countries of the world, including North African countries, is their ability to achieve a successful transition to an inclusive, viable and sustainable green economy that takes into account environmental constraints and balances. Doing this will require a better understanding of the fundamentals involved in such a transition, namely the inherent challenges, opportunities and potential impact.

It will take a wide-ranging reform exercise whose chances of success hinge on the efforts made by various public and private stakeholders, as well as the progress made by businesses in integrating environmental issues into their policies and activities. The idea is to get businesses to develop more efficient production methods which consume less raw material inputs such as water and energy, producing less waste and causing less harm to the environment while enabling them to improve their competitiveness and create more sustainable jobs.

Building a green economy is a long-term process whose first step is to understand the strategic position of businesses relative to this new model of wealth creation, growth and wellness. The gradual shift towards a new approach to the sustainable production of goods and services, the entrenchment of a culture that, in practice, fosters an environment-friendly productive capacity, the expected dividends from committing to a green economy, are all legitimate issues that any business would raise when opting to abide by environmental constraints.

As sources of production and consumption, businesses play a central role in the success of any reform, including the transition to a green economy. Accordingly, the objective of this study is to analyze the sensitivity and the degree to which industrial businesses commit to this new multidimensional concept. Such issues have become urgent and important as environmental concerns grow increasingly significant, to the point where the debate on the survival of natural capital has become the daily subject of national and international reflection. Therefore, apart from and along with the pressure exerted on nature, what should be highlighted are the substantive advantages of the green economy: job creation and the strengthening of social equity, the two major challenges facing North African countries.

Regarding businesses in the four North African countries (Morocco, Algeria, Tunisia and Egypt), this study assesses their progress in terms of a) understanding and preparedness to integrate the green economy, as a sustainable development component, into their production activities; b) perceiving the challenges involved and adopting environmental practices; and c) assessing the support measures needed to remove obstacles to the greening of their business economy.

To contribute to the discussion on the green economy in the four North African countries, this study examines three parts that together summarize business perceptions, practices and expectations regarding the green economy. First comes consideration of the green economy in the different national contexts so as to identify the strategic positioning of the main stakeholders (private-public sector) and secure some idea of the programmes and

systems instituted. The report then analyzes business responses to a survey questionnaire on four main themes. Finally come the recommendations which draw the necessary lessons from the analysis so as to identify the conditions that will encourage businesses to take greater ownership of the green economy.

1.2 Objective and methodology

This study aims at identifying and defining national and business level perceptions, strategic positioning and practices in the different countries. The lesson from this exercise will help in identifying the necessary conditions for the emergence and development of a green economy in North Africa.

To shed some light idance on the level of business perceptions, experiences, needs and expectations, this study used a questionnaire prepared by the Office for North Africa of the United Nations Economic Commission for Africa. The questionnaire asked 20 questions all focusing on determining the degree to which businesses could buy into the greening of the national economy in four main areas, namely:

- i. Defining the degree to which the various businesses interviewed perceived the green economy by;
- ii. Defining the policies, practices and tools developed by businesses to promote a green economy;
- iii. Identifying and quantifying business investments made to promote the main components of a green economy;
- iv. Defining the business perspective on national green public policies and incentive schemes;

The questionnaire was designed for businesses operating in various economic sectors and having some experience of the green economy.

A country report has been prepared for each of the four countries, based on the responses to the questionnaires sent to about fifty companies in each country, 20 of which, on average, replied. This report is a summary of the four country reports.

It should be noted that the size of the sample under study (a total of 80 companies), and its representativeness (against the heterogeneity of the business fabric in the countries), does not allow for a comprehensive analysis. However, the study has drawn a number of useful conclusions and lessons.

2 - Subregional Context

2.1 Major socio-economic features of the four countries

The four countries herein studied, namely Morocco, Algeria, Tunisia and Egypt, are home to over 150 million people. Egypt has the largest population with over 83 million inhabitants and Tunisia is the least populated with 11 million inhabitants. Algeria and Morocco come in between with 39.93 million and 33.49 million inhabitants respectively. As shown in table 1, the four countries are not equal in terms of national wealth..

They have substantial natural resources (oil and gas, minerals, agriculture, fisheries, biodiversity, etc.) and enjoy a relatively advanced level of socio-economic development. Agriculture accounts for a significant share of the subregion's wealth, around 9% of the GDP in Algeria and Tunisia and more than 14% in Morocco and Egypt. The industrial sector is unequally developed across the four countries, accounting for a very important share in Algeria - about 50% of GDP - mainly in the oil and gas industry. In the three other countries, the industrial sector is predominantly made up of SMEs, accounting for up to 40% of the GDP in Egypt. As for the services sector, Tunisia remains the most developed. It accounts for around 62% of national GDP. In Algeria, it represents slightly more than 42%.

Table 1 : Main socio-economic features of Morocco, Algeria, Tunisia and Egypt.

	Morocco	Algeria	Tunisia	Egypt
Population ¹	33.49	39.93	11.02	83.39
GDP/capita in market USD ²	3099	5264	4264	3261
HDI, 2014 ³	0.617	0.717	0.721	0.682
Life expectancy at birth in 2012 ⁴	71	71	75	71
Poverty rate, 2012	28%	5%	18%	26%
Unemployment rate 2013 ⁵	9.2%	9.8%	15.9%	13.4%
Share of agriculture in GDP (in%)	14.6	9.7	8.7	14.5
Share of industry in GDP (in%)	29.6	48.5	29.4	39.2
Share of services in GDP (in%)	55.8	42.2	61.9	46.3

Sources : « Economic and Social Conditions in North Africa », ECA ; 2014, « Human Development Report 2014 », World Bank, 2012,2013.

As far as human development is concerned, the four countries, Tunisia, Algeria, Egypt

1 - World Bank, 2014

2 - World Bank, 2013

3 - UNDP. Report on human development, 2014

4 - World Bank, 2012

and Morocco rank 90th, 93th, 110th and 129th respectively out of 187 countries, with human development levels considered as high for Tunisia and Algeria and medium for Egypt and Morocco which along with Egypt posts high poverty rates. Unemployment too remains high, especially in Tunisia where the rate stands at about 16% after the revolution.

2.2 Key environmental issues across the region

As a result of a more or less severe aridity and longstanding human pressure, natural resources in the North African sub-region are limited and fragile. Water deficit and sometimes water scarcity affect all four countries, particularly Tunisia with about 433 m³ per person per year. The exploitation of renewable water resources is saturated in Egypt leaving no room for new forms of such resource use. For other countries, the situation is in no way better, giving rise, locally and in some regions, particularly in the coastal area, to exploitation rates much higher than aquifer renewal capacity.

Forest cover in North Africa is quite limited and varies by country. In Morocco and Tunisia, vegetation cover constitutes respectively 11.5% and 6.6% of the total surface area. Elsewhere, forest areas are marginal, representing in Egypt, for example, only 0.1% of the total land area.

Desertification affects over 80% of land throughout the subregion which is increasingly threatened by erosion and soil salinity. A large percentage of the population (over 36% in Morocco and Tunisia) still occupies and lives on degraded land.

Pollution, whether air or water, is considerable in the subregion, causing the death of a significant number of children under 5 years of age; in Morocco, for example, almost 130/10,000 children die every year.

Table 2 :Main environmental indicators

Main environmental indicators	Morocco	Algeria	Tunisia	Egypt
Potential of renewable freshwater resources in m ³ / per capita/ year ⁶	878	297	423	1057
Exploitation of freshwater as % of total renewable resources ⁷	43.5%	48.9%	61.7%	96.6%
Supply rate of fossil fuel	93.6%	99.9%	85.3%	96.5%
Forestry area as% of total area, 2011	11.5%	0.6%	6.6%	0.1%
Annual forest trend and development (1990-2010)	0.9%	0.35%	5.88%	2.98%
Protected areas as% of the territory, 2013	1.5%	6.2%	1.3%	6.1%
% of population living on degraded lands, 2010	39.1%	28.8%	36.7%	25.3%

Carbon dioxide emissions in tons/person ⁸	1.6	3.3	2.5	2.6
Household waste recycling rate ⁹	8%	7%	4%	10 à 15%
Infant mortality under 5 years/10 000 children due to air pollution	14	6	4	4
Infant mortality under 5 years/10 000 children due to water pollution	114	101	64	86

Sources : Aquastat, FAO, 2013, FAO, 2011, Human development report, UNDP, 2014, Key World Energy Statistics, 2014 IEA

Added to all these issues in the sub-region is the emergence of a new challenge: climate change. Forecasts show a warming of about 1°C by the year 2020 and disrupted rainfall patterns with a downward trend of 5% to 10%. By the year 2050, temperatures could rise by 3° C and rainfall decrease by 10 to 30%.

Within this context, water resources management is becoming more urgent. Some progress has been made but much remains to be done, particularly in demand management and optimization, mobilization of all resources whether «conventional» (especially underground water) or alternative (wastewater recycling, desalinization, and the regional management of trans-border aquifers).

This environmental situation may worsen in the future, due to increased carbon dioxide emissions resulting from increasingly sustained economic activities and increasingly spreading transportation mostly unsuited to environmental constraints as well as problems arising from inadequate treatment of wastes and wastewater.

In its report on the sustainable development goals in North Africa, the ECA identified four key goals for sustainable development:

- i. Objective 1: reducing the marginalization and social exclusion of vulnerable populations;
- ii. Objective 2: ensuring access for all to basic services, with focus on water and sanitation;
- iii. Objective 3: Securing the transition to an inclusive green economy;
- iv. Objective 4: building sustainable peace on a transparent basis.

The objective No.3, which is the focus of our study, has been broken down into four targets, green economy, sustainable protection of the environment, sustainable energy and inclusive growth.

6 - FAO. Aquastat, 2013

7 - UNDP. Report on human development, 2014

8 - World Bank, 2010

9 - Sweep Net Reports

3 - The state of the green economy

3.1 Visions, policies and strategic approaches

Most development and economic growth models adopted over the past few decades by the various countries have fostered the rapid accumulation of physical, financial and human capital, causing an excessive depletion and degradation of the natural capital. These development models have caused a variety of economic, social and ecological crises, which are all a result of the poor integration of environmental needs and requirements in production and consumption models. The overuse of natural resources beyond their renewal limits, pollution and environmental degradation, often mark the development patterns observed in this sub-region. Besides such environmental degradation, all North African countries suffer from acute unemployment rates, especially among young graduates.

The idea of sustainable growth, generally called the «green economy», has thus become a necessity to reconcile long-term management of natural resources, with the conception of new development alternatives that are more sensitive to environmental requirements, thereby creating new business activities and producing new wealth.

UNEP defined the concept of a green economy in its 2011 report as an economy «that results in improved human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities».

The term 'green economy' appeared in the North African countries only a few years ago and was introduced by environmental specialists within and outside Government, in various companies, professional circles and increasingly by the media. It is often compared to a new concept that completes or even, for some, replaces the concept of sustainable development. However, whatever position is given to the green economy in sustainable development policies, most stakeholders agree that it is, in general, a sustainable economy, as it is based on respecting the environment, generating less carbon, harm and pollution, rationalizing the use of natural resources, promoting a more sustained development path and fostering the emergence of new business activities. This means the gradual adoption of a new development model.

The analysis of the experiences of those countries that have initiated and implemented strategies providing for the transition to a green economy shows that the main causes for changing the development model vary from a country to another; however, there are four main factors that speed up, separately or jointly, such a transition:

- i. The implementation of policies to mitigate environmental degradation and to sustainably manage natural resources;
- ii. Economic crisis and the use of green investments as a way to boost the economy through the development of new green industrial activities and alternative energy to create growth and jobs;
- iii. Energy crisis and the rising prices of imported fossil fuels whose deposits are limited in time;

- iv. The deep conviction of the need to design and implement a new development model that is sustainable, respectful of environmental requirements and which creates more wealth and jobs, based on a review of citizen, consumer and market behavior in general.

All these reasons have variously led the four countries of the sub-region, Morocco, Tunisia, Algeria and Egypt to involve themselves gradually in the promotion of a green economy.

Based on a national environmental and sustainable development charter approved by all stakeholders and supported by the highest State authorities, Morocco has designed and implemented ambitious national programmes promoting renewable energy, sanitation and the management of solid household waste. In parallel, a number of financing funds, as well as tools for technical assistance, measurement, follow up and monitoring of environmental quality have been developed.

In Algeria, several plans and programmes relating to environmental protection and green economy promotion have been initiated in recent years. The national plan for the development of renewable energy, the energy-efficiency programme, the national programme for the integrated management of household and ancillary waste, and the national sanitation programme for wastewater are all cases in point. For example, Algeria assigned in 2011 a total funding of 120 billion dollars to produce 22.000 megawatts of electricity from renewable energy, over the coming 20 years.

In Tunisia, the programmes already initiated regarding energy management and renewable energy promotion, as well as those developed in such areas as waste management and sanitation, have recently been reinforced by a national effort to integrate them in a green economy that took the shape and form of the proposed development of a national strategy for sustainable development and the promotion of a green economy.

Egypt has been engaged, in recent years, in a national programme to promote renewable energy, focusing mainly on wind energy, as well as in industrial pollution abatement activities under the EPAP project.

3.2 Major programmes and initiatives

3.2.1 Energy-efficiency Programme

Energy efficiency aims at securing supplies, reducing their environmental impact and promoting social equity. Its improvement helps in achieving energy savings and alleviates the environmental impact of energy production and use.

In Morocco, energy efficiency, along with renewable energy development, is a major priority in the national energy strategy. This strategy aims at saving 12% of the energy consumption by the year 2020 and 15% by 2030. To do this, action plans to improve energy efficiency were put in place in such key sectors as transportation, industry, construction as well as agriculture. Several projects underway form part of the implementation of the energy efficiency programme. This includes the installation of solar water heaters, the generalization of energy audits in the industrial sector, the promotion of the use of energy-saving lamps and the installation of biomass boilers in agribusiness.

In Algeria, the action plan on energy efficiency covers many sectors, like the thermal insulation of buildings, the development of solar water heaters, the overall use of energy-saving lamps and the promotion of energy efficiency in the industrial sector. As for the construction sector, the largest energy consumer, the programmed actions target a 40% decrease in energy consumption over the coming decades.

In Tunisia, energy efficiency is one of the main pillars of the country's energy strategy. Worth noting is the country's determination to strengthen its energy efficiency policy by drawing up an ambitious programme covering all the sectors concerned.

The key actions in this strategy promote programme contracts and efficient lighting. Considered as an effective measure for the industrial sector, programme contracts are the main component of the energy efficiency policy. After the energy audit, institutions working in the industrial, transportation and tertiary sectors should sign a programme contract to take energy-saving measures. These institutions would benefit from a bonus of 70% of the cost of the audit and a grant representing 20% of their investment cost. The strongest effort was made in the industrial sector with the signing of 566 programme contracts over the period 2000-2011.

Regarding the Egyptian energy efficiency experience, the strategy in this area has evolved considerably over the years, making this issue one of the national priorities of the country's new energy vision. However, the implementation of the energy efficiency promotion programme faces some institutional and legal challenges, in addition to scarce data and information, and limited human capacity.

3.2.2 Renewable energy development Programme 3.2.2

As far as renewable energy development is concerned, the four countries have adopted policies to increase the use of concentrated solar power (CSP) and wind power to reduce dependence on fossil fuels, reduce greenhouse gas emissions and create new jobs.

In Egypt, during the past two decades, demand for electricity has soared considerably and its medium-term growth forecasts stand around 6.5% per year. This increase in demand has so far been absorbed by increased natural gas production. Aware of the depletion of fossil energy resources and the volatility of world energy prices, as well as the pollution resulting from its conventional power plants, the country is increasingly focusing on renewable energy. Indeed, it has significant solar and wind fields and the Egyptian government has set a target of producing 20% of electricity from renewable sources by 2020 (currently 1%), 12% of it from wind farms.

Morocco has undertaken, in recent years, large sectoral programmes, giving particular attention to the implementation of the solar plan and the integrated wind programme. Nearly 20% of national electricity production is expected to come from alternative energy sources. The signing of the Energy Charter Declaration could raise the country's profile for the sector and make it more attractive to international investors and energy industry stakeholders. Several donors are already cooperating with Morocco for carrying out innovative projects providing for the development of power plants using modern technologies.

Tunisia's 2010-2030 solar plan covers such areas as energy efficiency in transport, buildings and energy-intensive industries, as well as renewable energy (solar, wind and biomass). Both the public and private sectors will be involved in the implementation of this programme which will be accompanied by a set of administrative, regulatory and financial support mechanisms.

The plan also includes building a capacity to produce 4.7 GW of electricity from renewable energy by the year 2030, and the pursuit of the energy efficiency programme in the different sectors. The objective is to save 100 Mtoe of accumulated energy by 2030. In this regard, the Tunisian solar plan aims at implementing some 50 projects in the field of solar energy, that could create nearly 18.000 direct and indirect jobs.

Algeria's efforts have also focused on the promotion of renewable energy through ambitious State-led programmes, in order to build a renewable energy capacity of nearly 22,000 MW over the period 2011-2030, that is about 40% of the national electricity production, 37% of which will come from solar and 3% from wind energy. Investments in these sectors benefit from tax and business incentives. The National Energy Management Fund (FNME) finances projects and provides interest-free loans and guarantees for borrowings from banks and financial institutions.

3.2.3 Integrated Waste Management Programme

Although the subregion's Governments have taken many initiatives to develop the waste management sector, efforts in this area have not yielded the desired results.

In Egypt, less than 65% of waste produced is collected, disposed of or recycled by the different public and private actors. The remainder accumulates in the streets and in illegal dumps. Waste production is expected to exceed 30 million tons per year by 2025. Two major action plans have been instituted in Egypt.

- The environmental policy programme which aims at improving the performance of the solid waste management sector through better strategic planning, increased public awareness raising and support for private sector participation;
- The National Integrated Municipal Solid Waste Management Programme whose objectives are: eliminating uncontrolled accumulation of solid waste and providing safe and efficient services for waste storage, collection, transfer and management in all urban and rural areas.

Morocco has taken similar measures, as the country is facing a sustained increase in the volume of waste resulting not only from steady population growth, but also from changing production and consumption patterns. Several programmes and initiatives have been launched, most importantly:

- The National Household Waste Programme
- The National Programme for the Elimination of Special Waste

In Tunisia, waste recycling and reuse are increasingly becoming components of the green economy. Household waste is well managed through the implementation of a policy of controlled landfilling currently covering 70% of the waste produced. Recycling and reuse, however, are not yet wide-spread and remain limited to products traditionally known to be profitable, such as plastic and metals. In 2010, the first plant capable of

generating about 2.4 GWh/year of biogas power from organic waste was launched and its residues would be used as fertilizer for organic farming. For example, the plastic recovery industry has created, since its inception in 2001, more than 150 companies, over half of them run by higher education graduates. About 100,000 tons of plastic have been recovered since the start of this business activity.

In Algeria, the National Waste Agency, under the Ministry of Spatial Planning and Environment, is responsible for communicating and broadening the use of sorting, collection, transportation, treatment, recovery and disposal techniques. According to the National Management Programme for Integrated Household and Ancillary Waste Management (PNGIDMA), households produce 13.5 million tons of waste per year, 55% of which is considered organic and 45% can be recycled (6.1 MT / year), - a DA 28 billion or USD 354 million business. Incentive mechanisms have been put in place to stimulate the creation of micro-enterprises specializing in business related to household and ancillary waste management. Waste collection, sorting, recycling and landfilling should be outsourced. The National Environment and Pollution Abatement Fund (FEDEP), the National Waste Agency (AND) and the National Agency to Support Youth Employment (ANSEJ) are all involved in a project to create 5,000 micro-enterprises that should provide 10,000 green jobs per year over the period 2012-2025.

3.2.4 Waste Water Sanitation Programme

The four countries are stepping up wastewater treatment projects to protect their environment and natural resources, and improve living conditions for their people. They have all started or partly completed major sanitation projects.

In this respect, Morocco will be taking up, over the next few years, a number of challenges having to do with poor sewage treatment (only 20% of the collected water is treated), the connection of rural areas with drinking water (especially for scattered villages) and the maintenance and operation of water systems in rural areas (20% of which are not functional).

In 2005, the Moroccan Government launched its «National Sanitation Programme» (PNA) targeting the treatment of as much as 60% of collected water and connecting as much as 80% of urban areas to the sanitation network by 2020. The NSP also aims to reduce domestic air pollution by 80% in 2020 and by 90% in 2030. Similarly, the programme aims to treat and reuse 100% of the water collected by the year 2030.

The industrial sector in Morocco is still one of the main causes of water pollution. The marine environment is the main receiver of industrial waste, since more than 80% of industries are based along the coast. About 1,000 million cubic meters of industrial wastewater, mainly from the chemical industry, is discharged annually into the marine environment.

In order to purify all wastewater discharges across the country, Algeria had (as of 2014), 150 operational treatment plants having an installed capacity of around 850 million m³/year, against the 30 treatment plants it had in 1999 with an installed capacity of 90 million m³/year. Although it is no longer the worst component of the sanitation sector, wastewater treatment still needs to phase out all the existing septic tanks in the country. Algeria plans to invest in the recovery of waste water for farmland irrigation purposes. Various such projects have been launched in several parts of the country.

Tunisia has a well established network for wastewater treatment. Since its foundation in 1974, the National Sanitation Office (ONAS) has made notable progress in the sanitation sector. It has connected more than 89% of the urban population (not including areas outside of ONAS jurisdiction) to a network that spans over more than 14,500 km (2012 data), while building 111 wastewater purification plants (2011 data). ONAS's jurisdiction covers large and small cities as well as towns having more than 4,000 inhabitants, industrial and tourist areas. According to official data, over 90% of the wastewater collected by ONAS is processed, and more than 20% of treated wastewater is reused.

Egypt has made significant progress in the water and sanitation sector in recent decades, investing nearly USD 26 billion from 1977 to 2006, to achieve a satisfactory coverage rate despite strong population growth. In recent years, however, the sanitation situation has deteriorated and become a major challenge, both in terms of access and collected wastewater processing. According to the WHO follow-up programme, from 1990 to 2004, overall access to basic sanitation increased from 54% to 70%. Collective sanitation is provided to 68% of the urban population and to 13% of the rural population.

3.2.5 Industrial Pollution Control Programme

According to statistics from its Ministry of Industry, Trade and New Technologies Morocco's processing industry consists of some 8,000 companies. Chemical and para-chemical industries, especially phosphate-processing factories, remain the most important source of liquid waste (931 million m³, 22.7 million m³ of which comes from non-phosphate businesses). Textile and leather companies produce relatively low amounts of liquid waste (16.5 million m³) rich, however, in pollutants (mainly from tanneries that discharge chromium and sulphur). Food industry releases nearly 40.7 million m³ of waste water, which accounts for 90% of water used in the sector. Receiving 948 million m³/year, that is 98% of effluent, the sea remains the main dump, followed by watercourses with 14 million m³/year, that is 1.45% of discharges.

Hazardous industrial waste is estimated at about 256,000 cubic tons/year. Regional distribution shows that Greater Casablanca region is producing about 37% of it. The chemistry-parachemistry and textile-leather sectors deposit 40% and 33% of such waste.

To save natural resources and use clean technology the industrial pollution abatement programme aims to encourage industrial and traditional enterprises to invest in pollution abatement through the treatment or elimination of liquid, solid or gas waste.

Tunisia has the same concern, as industrial pollution abatement ranks high on the list of priority business niches. The country is facing serious pollution problems. The most polluting activities are mining, phosphate processing, construction metals, textile, food processing and energy production. Investment in industrial pollution control facilities has been encouraged since 1993 with the creation of a special fund: the Industrial Pollution Abatement Fund (FODEP) managed by the National Agency for Environmental Protection (ANPE). Only 15 of the country's 121 industrial zones have acceptable performance and there are many hot spots (Bizerte, Kasserine, Sfax, Gabes, etc.) where pollution is largely produced by the industrial sector. In 2007, out of nearly 9,500 businesses, 1,200 are polluting (12.5%). Effluents from industries located near cities and towns exacerbate pollution problems in urban areas. Affected areas are the suburbs of

Tunis, Sfax, Bizerte, Sousse and Gabes. Despite efforts to control spills, industrial effluents remain a major source of pollution for the coastal and marine environment, and decisively contribute to the contamination of water, soil and air.

In Algeria, industry has played a special role in the environmental crisis, being the worst offender, in the minds of people, for the degradation of ecosystems, natural areas and resources, and for air pollution. The extent and seriousness of industrial pollution and its impact on the environment is evident. Indeed, the strong industrial development that took place during the 60s and 70s created an industry slow to upgrade that has become a heavy environmental liability. In order to curb pollution resulting from industrial activities, the Ministry of Spatial Planning and Environment has introduced coercive measures for enforcing limit values for industrial waste discharges, and imposed in certain cases, the submission of an impact study before issuing authorization. It has also instituted incentives for environmental management, encouraging businesses to use a number of environmental management tools made available for them: environmental audits, environment charter and performance contracts in which they commit to implement a five-year environmental action plan.

Under the pressures of rapid economic growth, coupled with an ambitious development process and industrialization policies, Egypt is witnessing a serious air, water and soil pollution problem, which could ultimately undermine the country's ambitious development efforts.

The Alexandria and Greater Cairo regions, where polluting industries are concentrated near high population density areas, are particularly representative of the magnitude of this national challenge. The Government has demonstrated its commitment in this regard through the establishment of a comprehensive legislative system and the creation of the «Egyptian Environmental Affairs Agency (EEAA), the executive body of the Ministry of Environment. As a result of political and public pressure, industrialists have also become aware of the need to build environment-friendly facilities in Egypt. Financing the necessary investments will require banking sector support.

In 2006, AFD, the World Bank, the European Investment Bank and the Japan International Cooperation Agency decided to support these different industrial pollution control stakeholders by implementing EPAP II (Egyptian Pollution Abatement Project II). This programme has two main components:

- Financing air and water pollution abatement in Alexandria and Greater Cairo areas;
- Partner banks and local stakeholders providing technical assistance to help build the capacities of EEAA..

Mid-way in September 2009, 19 companies joined the programme, proposing 34 projects worth USD 413 million and requesting funds amounting to USD 147 million, that is over USD 29 million of subsidies, as part of an EPAP II credit line. The reduction of SO₂ emissions reached 22,700 t/year and that of particles 104,000 t/year. In addition, several other pollutants have been completely eliminated through a change in manufacturing processes. The Egyptian Government announced that the third phase (EPAP III) will begin in 2015, focusing not only on large industries, but also on SMLs.

3.2.6 Environmental Certification Support Programme

Environmental certification defines a series of specific requirements for the establishment of an environmental management system within the company, whatever the size and area of activity. The country reports of the four countries mention some environmental certifications that companies in the subregion have often developed voluntarily.

In Morocco, the majority of businesses expressed their willingness to invest financially in order to strengthen their brand image. According to Morocco's report, although environmental certifications are still at their launching stage, the popularity of this type of tool is increasingly growing. This new dynamic is explained by the emergence in recent years of binding regulations, in addition to the national environmental policy reflected by the National Charter for Environment and Sustainable Development.

In 2006, Algeria signed an agreement with GIZ to incorporate ISO 14001 environmental management and certification in Algerian companies. That was an upgrade programme committing the industry sector to reduce polluting discharges associated with its activities, using an environmental management approach.

The objective of this initiative is to align Algerian companies with the international economic environment by getting them upgraded through ISO-9000 and 14000 certification, to ultimately improve their competitiveness under the challenge of globalization. The initiative also covers the training of qualified business personnel in environmental matters and of internal ISO 14001 auditors accredited internationally.

However, the specialists in company standardization issued an alarming report on the compliance of Algerian companies with environmental management standards, namely ISO 14001 certification. In Algeria, only seven companies are ISO 14001 certified. This is directly related to the lack of awareness about environmental management standards; in fact, some entrepreneurs do not even know that the State pays 50% of the costs incurred in environmental management certification (ISO 14001).

In Tunisia, environmental performance certification is the approach most adopted by Tunisian firms. Although the number of industrial enterprises is around 5,500, only around 200 are ISO 14001 certified (GIZ, 2013). The Government wants to significantly increase this figure. Knowing that business leaders consider this an expensive process, additional efforts are needed, particularly to raise SME awareness and to get them to voluntarily adhere to the certification system. In Egypt, the priority area for environmental certification is farming since many farmers are engaged in efforts to reduce its impact on the environment. Such initiatives are voluntary and come under sector-wide, country-wide or individual project approaches.

3.2.7 New green industries' promotion Programme

To curb unemployment, particularly that of young graduates, and build on the green economy potential and its windows of opportunity, green business promotion initiatives have been launched over the past few years in the four North African countries covered by this study.

Often conducted with the support of donors (UNDP, GIZ, JICA, World Bank, etc.), such projects have sought to support national positioning for new occupations that could be created through promotion of the green economy and generally adopt a three-pronged approach:

- Identifying high potential niches which could profitably be developed in promoting green business activities;
- Training job seekers, especially young unemployed graduates in the new green business activities in the high potential niches identified;
- Coaching the trained youth in the administrative and financial arrangements for starting their businesses.

We do not have the necessary hindsight to conduct a genuine assessment of the degree to which such programmes have actually contributed to the creation of jobs and new occupations.

4 - Industry and the green economy

The substance of this chapter comes from the analysis of the country studies conducted on the basis of business responses to the questionnaire sent out to the four countries surveyed.

4.1 The main environmental challenges faced by businesses

Companies face many environmental issues and challenges, two of which stand out systematically in all the businesses surveyed: energy cost management, the rational use of energy and waste management (reduction, recycling and recovery). To a lesser extent, but across the board in the four countries, the treatment of wastewater discharged by companies and the prevention of pollution constitute a second level of priority and concern for all businesses. The third priority level goes to the rational use of water resources with disparities between countries (low in Egypt and strong in Tunisia) as well as to the promotion of renewable energies. Reduction of carbon dioxide emissions, followed by biodiversity protection, constitute the lowest priorities for companies in the sub-region.

Table 3 :Degree of priority accorded by businesses to major environmental issues.

Environmental issues faced by businesses	Level of priority given to environmental issues
Rational use of energy (energy efficiency)	Very high
Waste reduction, recycling and recovery	Very high
Wastewater treatment and recycling	High
Pollution prevention (water, soil, air)	High
Rational use of water	Average
Renewable energy development	Average
Reduction of carbon dioxide emissions	Low
Biodiversity protection	Very low

This table shows clearly that the energy cost of doing business is increasingly hindering its development. The need to reduce energy costs is ubiquitous among entrepreneurs. Proper waste management with some recovery and a consequent reduction in management costs are also a priority; compliance with relevant regulations and increasing social pressure are certainly the main causes. Wastewater treatment and pollution prevention in general are the avowed priorities of all actors, State and civil society alike. In contrast, the relatively low price of water in the subregion, does not encourage businesses to make water conservation a priority although the sub-region suffers from a widespread water deficit.

What is keeping businesses from developing appropriate technologies to promote the use of renewable energy is both their ignorance of such technologies and the lack of a sufficiently encouraging legal framework.

In contrast, the purely environmental concepts of reducing carbon dioxide emissions and protecting biodiversity fail to attract businesses sufficiently because they have yet to see the connection between their activities and issues they tend to consider completely alien to their interests.

4.2 Business perceptions and viewpoints on the green economy

- **Companies see the green economy as an opportunity to strengthen their social and environmental responsibility**

In general and across the four countries, almost all the companies know the main fundamentals of a green economy, its main environmental and economic benefits and, to a lesser extent, its social benefits. They describe the green economy as a future opportunity to seize in order to strengthen their position on national and international markets. The situation is, however, different for Algerian companies that have yet to show the same conviction as their neighbours in the other three countries. However, and in general, the green economy is a way for companies to improve their social and environmental responsibility (SER). This certainly shows the place of this concept and the advances being made to promote SER in North Africa.

Going by the current situation of the green economy in the subregion and in the world, only one quarter of the businesses believe that the green economy has become a reality while almost half of them think that it can grow and spread in the future.

- **The green economy is an alternative offering a multitude of opportunities, mainly environmental and economic**

In general and in terms of opportunities, the green economy is well considered by companies in the subregion.

First, it is an alternative to pollution by introducing clean production methods and reducing impacts on the environment and natural resources; to a lesser though still important extent, the green economy is an opportunity to innovate and develop new technologies in different production cycles with a significant effect on reducing the associated costs. This approach could help companies to reach new markets and improve their positioning on already accessed markets.

Table 4 : Windows of opportunity provided by the green economy to businesses

Opportunities offered by green economy to companies	Level of opportunity offered by the green economy
Cleaner production, and consequent reduction of the company's environmental impact	High level
Development of innovative technologies and products	High ++
Reduction of production costs, and consequently, increase of business profits	High ++
Access to new markets	High +
Social marketing of the company conferring a competitive advantage	High +
Creation/ diversification of specific sectors	Average
Creation of sustainable jobs	Average
Alleviation of social inequalities	Low

The creation of new industries and the development of sustainable jobs are not yet significantly seen as real opportunities of the green economy. Except in the case of Egypt, even less does reducing social inequalities appear as an objective that the green economy would help to achieve..

- **Companies think they have some relevant capacities to develop the green economy**

Half of the companies in Algeria, Tunisia and Egypt and three quarters in Morocco think they have sufficient expertise to promote and develop the green economy within their plants. This relatively high rate is explained by the fact that respondents are most predisposed to engage in activities related to the green economy and relatively have the necessary resources (above the business average). Hence the need to put this finding into perspective.

4.3 Business policies, practices and tools

4.3.1 Policies

- **Companies are progressively, but slowly, pursuing the implementation of a green economy policy**

More than half of the industrial companies surveyed avow having a green economy related policy but it is in Morocco that companies are most committed to this perspective.

In the four countries examined, business development and implementation of green economy policies comes essentially from a willingness to comply with national environmental regulations in force, and to a lesser extent, from a desire to improve business image and to reduce the costs of natural resource and raw material inputs, while taking SER issues into account and considering the fact that international competition is increasingly punishing businesses that are not-environment-friendly.

Other social arguments such as demographic pressure and changes in consumer and client demand are still rarely taken into account by companies.

Indeed, people still do not exert on companies significant pressure to make them change practices and operating procedures so changes in consumer demand are not yet significantly visible for companies to be considered.

- **Business environmental, economic, social and governance strategies**

For all the countries (and Egypt to a lower degree), the efficient use of natural resources, raw materials and energy forms the bottom line of the green economy policy of business companies.

At a second but equally significant level, the reduction and management of waste, especially wastewater, and overall pollution prevention are the key priorities in the green economy policy pursued by the companies. The issue of waste is seriously taken into account by virtually all North African firms; the issue of wastewater management, however, varies from one country to another, it is strong in Algeria and Tunisia and relatively low in Egypt.

Nevertheless, among industrial companies in the four countries, there is no genuine desire to introduce the reduction of carbon dioxide emissions into their green economy policies.

Socially, industrial companies in Morocco, Algeria and Tunisia take into account in a very clear manner the aim of improving the working conditions of their staff (health and safety) and their capacity building. This seems less pronounced in Egyptian companies.

As for concerns external to the location of the company, entrepreneurs in the four countries give less importance to such social issues as providing transport for their staff or participating in social or local development projects in general.

Economically, improving company productivity and competitiveness is central to the business ethos, particularly in Morocco and Algeria. In contrast, investment in research, development and innovation rank low in business strategies, with only 15% of Algerian companies clearly expressing a commitment in this regard.

In terms of governance, companies consider that staff awareness of environmental considerations should be paramount in any green economy policy. However, dialoguing with staff and the surrounding community as well as informing and educating company clients about adopted environmental approaches have yet with the exception of Algerian companies, to become a business priority.

4.3.2 Business practices and tools

- **Environmental management is increasingly becoming an essential business tool**

The majority of companies have announced their involvement in an environmental management development process in their production plants. Regulatory monitoring in the field of the environment, environmental diagnosis and SER are the tools developed in Morocco, Algeria, Tunisia, and to a lesser extent in Egypt. Although partially used in Tunisia and Egypt, environmental performance contracts, carbon footprints and eco-labeling are generally little used in the four countries.

In terms of environmental certification, ISO 9001 (quality management) is the most common certification in the various countries. ISO 14001 (environmental management) is significantly gaining ground in Tunisia and Morocco, while social responsibility ISO 26000 which is fairly present in Algeria, has hardly started anywhere else. ISO 50001 certification (energy management) is not at all developed in the subregion's businesses.

- **Research-development and training in green economy-related fields are still limited in companies**

Although a significant number of the firms have engaged in training programmes within their companies in green economy-related areas, such training remain relatively underdeveloped and for the most part, poorly anchored in the daily practices of employees and often having a weak impact on environmental management performance.

Green economy research and development programmes are still highly underdeveloped within companies, despite the few initiatives that tend more towards the acquisition of technologies ready for operation and use rather than innovation and adaptation based on business experience and specificities.

- **Business investment levels in the green economy often unknown**

In general, industrial enterprises do not have accounting specific to green economy related activities. Investments in this area are limited and are made, most of the time, only in response to regulatory constraints and, in some cases, to pressure from the people.

4.4 Business-side constraints

- **Weak investment capacities, limited access to new technologies and insufficient expertise, are the main obstacles to promotion of the green economy**

Despite the avowed willingness of most companies to get involved in green economy programmes and actions, with the main objective of reducing their environmental impact and improving efficiency in terms of natural resource exploitation and energy use, companies often face, most of the time, inhibiting difficulties and serious constraints.

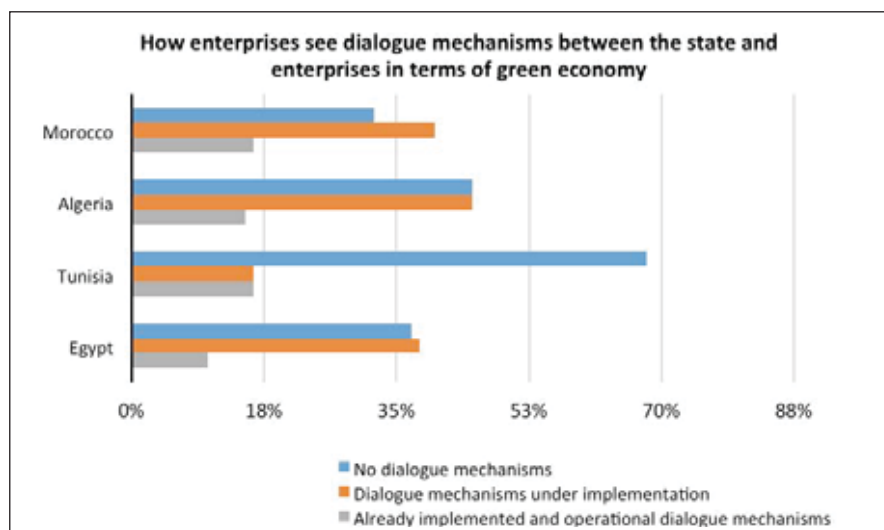
The often difficult financial situations of companies and their low capacity to generate complementary investments, that are generally considered unprofitable for their core business, discourage firms from engaging in green economy actions. Opportunities for access to special funds or specialized credit lines are often considered binding or at least unprofitable. Over $\frac{3}{4}$ of the companies think that the limited and difficult access to investment is the main constraint hindering the emergence of green economy.

Besides this very important financial aspect, companies also report an equally important constraint faced in different countries and acting as a major obstacle for the adaptation and implementation of less polluting and less resource-consuming new processes in terms of natural resources and energy. This constraint is the ability to access new technologies and their integration into business processes. Despite a quite satisfactory access to information, this dual challenge reflects the barriers currently faced in the transfer of technology between the developed and developing countries of the region, and the weak capacity of local expertise in identifying the best technical solutions and their adaptation to the local context.

- **Dialogue mechanisms between the state and businesses are weak and unproductive**

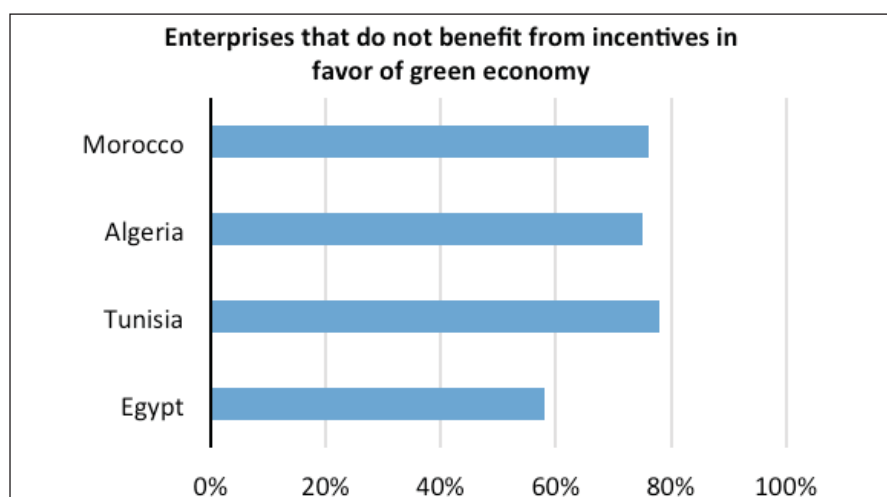
At this stage of its development, the promotion of green economy depends on the establishment of genuine mechanisms for dialogue and consultation between the state and businesses. This exchange should demonstrate to businesses the positive impacts of the involvement and investment in green economy. It should also allow the state and businesses to jointly build the framework for the promotion of a genuine green economy through the definition of more realistic and more efficient modalities and instruments to meet the technical and financial support that businesses need.

Today, the mechanisms for dialogue between the state and companies on the issue remain insufficient. They are either not established at all or are in the process of partial implementation.



- **Industrial companies do not sufficiently benefit from the rare incentives put in place by public authorities in favor of green economy**

While most countries have in recent years began the establishment and development of both technical and financial incentive mechanisms in favor of green economy, industrial enterprises have not shown special interest in this type of support. Overall, more than 70% of respondents in the four countries say they do not benefit from such mechanisms. This is certainly due to a lack of information and above all the inadequacy of the incentives to the businesses' capacities and characteristics.



As for the enterprises that benefit from incentives, they mainly seem interested in three incentives: access to subsidies, support for environmental certification, and general advice and support to the elaboration of studies and diagnosis.

4.5 Business expectations

Industry actors in the four countries quite clearly grasped the gaps that hinder the emergence of green economy today. They also have a relatively clear idea of the steps the government must make to promote the emergence of green economy. A dozen of strategic, regulatory, financial and technical measures emerge from their suggestions, as shown by the table below.

Table 5 : Main measures and public actions suggested by companies

Nature of measures	Measures and public actions suggested by companies	Tunisia	Morocco	Algeria	Egypt
		Level of priority given to the measure ¹⁰			
Strategic	Strong political will	A	A	A	A
	Adoption of a long term strategic framework for green economy	B	A	B	B
	Reorientation of the industrial policy	C	C	B	C
Regulatory	Adaptation of the environmental regulatory framework	B	B	C	D
	Strengthening the monitoring of environmental compliance	C	B	C	C
	Adoption of environmental standards related to processes and products	A	C	C	C
Financial, tax and tariff related	Improvement of the access to financing and the establishment of a fund dedicated to green economy	C	A	B	B
	Establishment of an environment-specific tax regulation: taxes and fees on polluting activities	C	B	B	C
	Reform of energy pricing	B	C	C	B
	Reform of water pricing	C	C	C	B
Technical	Environmental upgrade of companies	B	B	B	C
	Launch of information, education and communication programmes	B	C	B	B

Strategically, companies consider it essential that the authorities clearly express their political will to support the transition toward green economy. This must be fulfilled by setting a clear framework defining all the measures to be undertaken at all levels, particularly the institutional, financial, technical and regulatory levels, to ensure the emergence of green economy in key areas of development. On the ground however, the overall strategy is unfortunately very minimally supported by a strategy specific to the industrial sector aiming to reorient it towards green economy.

As far as regulation is concerned, three measures are essential: the adaptation of the environmental regulatory framework; strengthening the control of environmental compliance to push offenders to repair the damage; and finally the adoption of environmental standards for processes and products.

At the financial, fiscal and tariff scales, enterprises think that access to funding in the area of green economy, through a specific fund for example, is a prerequisite for the promotion of green economy related activities. The introduction of environmental taxation and the revision of rates for certain strategic products such as water and energy, would encourage actors to increasingly engage actions towards green economy.

At the technical level, the promotion of an environmental upgrade program within companies and the launch and implementation of an information, education and communication program are considered by companies as necessary conditions for the emergence and development of green practices

5 - Conclusions

The four North African countries (Morocco, Algeria, Tunisia and Egypt) are facing multiple political, socio-economic, environmental and governance issues. Tunisia and Egypt are both going through democratic transition and the reconstruction of their respective regimes. Unemployment and access to jobs, especially for young people, remain a serious obstacle for development; 16% of the workforce is unemployed in Tunisia. Egypt is still facing serious socio-economic difficulties under the weight of the region's largest population and lowest economic level, compared to other countries with a GDP of \$ 1,566 / capita.

At the environmental level, all countries of the region have a limited and fragile natural capital. Despite its precariousness, the latter is weakened by the desertification that reaches significant extents in the region, as well as the various nuisance and damage caused by human activities. These harms mainly take two forms, pollution and degradation on the one hand, and overexploitation of natural resources on the other. Industrial activities in the four countries are the main causes of this degradation. In Algeria, the major industrial arsenal installed, in the most part, several decades ago, now seems to relatively lag behind the new and more demanding environment-related practices.

In light of these challenges, and under the weight of increasingly strong social pressures, the four countries are now forced to think and design new models of development that are more suited to the context of their respective countries, in harmony with the international situation, and are able to respond positively to the demands of the population, particularly in terms of creating new wealth, new jobs and social equity.

Green economy could be for the four countries a significant opportunity to make this long desired transition happen. Several realities and intrinsic characteristics favor the emergence of this new development mode in these countries: significant potential savings in energy and renewable energy; the desire to reduce the human activities impacts on the environment, preserve natural resources and rationalize their use; the need to adapt to climate change in the coming decades; and the urgent imperative to improve the socioeconomic conditions of the most vulnerable populations. All those are arguments and opportunities that can, put together, push each of the countries of the region to become truly involved in promoting this new form of economy.

Green economy has the merit of providing a dual response to the challenges of the region; first, it solves important and critical environment and energy issues, second, it provides the opportunity to create new approaches and new niches that can generate new wealth and new jobs.

For these reasons, the four countries are already involved, each according to its means and priorities, in the adoption and implementation of many green economy programmes and projects.

Energy, with its two components consumption efficiency and renewable energies promotion, is undoubtedly the most needed area in most countries and particularly in Morocco, Tunisia and Egypt. Energy saving in these three countries is increasingly equated with new resources that are sought in the different areas of

development, especially in construction, transportation, and, to a lesser degree industry. The promotion of renewable energies, especially in small installations is gaining more and more ground. It become in several regions and among certain populations as the most profitable alternative economically. The next step is to see mega projects being planned, especially in solar energy but also wind energy which is gradually happening in some countries like Egypt.

Wastewater treatment and waste management, especially household waste, have taken an ever increasing importance in all countries, and are subject to a set of programs and projects, often with ambitious goals. This dynamic concerning household waste is not mirrored with a same-scale dynamic when it comes to industrial and special waste, which is still lagging behind. Treatment projects of liquid, solid and gaseous waste emanating from industrial actors remain below the real problems and impacts caused by industrial activity on the environment and human health. Similarly and in the same vein, assistance, especially technical one, provided to companies regarding the promotion of green economy activities or environmental certification remains generally limited.

Concretely and through the analyses we have performed throughout this expertise, businesses in the four countries participate, with variable degrees, in green economy. Morocco and Tunisia have relatively pronounced political will, translated into genuine projects whose results are already being seen in some areas. However, this momentum does not seem as strong in Algeria and Egypt. The weight of an industrial background that is not environmentally friendly and the low commitment to power saving have so far limited the level of Algeria's involvement in green economy. In Egypt, the constraints of the democratic transition, and the considerable basic needs of a large part of the population delay the transition to green economy. The following table gives summary indications on all aspects seen in this conclusion.

Table 6 :Summary and comparative analysis of the four countries of North Africa, Morocco, Algeria, Tunisia and Egypt.

Country	Major socio-economic and environmental challenges	Opportunities and new orientations	Strategic framework and main programmes and initiatives	Appreciation of the degree of promotion of green economy
Morocco	<ul style="list-style-type: none"> • High poverty level • Limited and fragile natural capital (water, forests, soil) and serious desertification • Large amount of untreated industrial waste • Risk of natural resources degradation and harm to human health (wastewater, waste, gas) • Negative Energy balance 	<ul style="list-style-type: none"> • Democratic Transition • High EE and RE Potential • Huge impacts on environment and willingness to ease their magnitude • Willingness to preserve natural resources • Adaptation to CC effects • Need to improve socio-economic conditions of the poor populations 	<ul style="list-style-type: none"> • National Charter for Environment and sustainable development • National Plan against climate change • Development of EE and RE (Solar Plan, wind farms and institutions and regulatory support framework) • National Sanitation Programme • National Programme for the management of solid household waste 	<ul style="list-style-type: none"> • Morocco is really involved in a policy for green economy promotion • his commitment is shown at different levels from a sector to another • Renewable energy is a national priority in Morocco • Industrial pollution abatement and the environmental upgrade of businesses are the main future commitments of the country

<p>Algeria</p>	<ul style="list-style-type: none"> • Industry is lagging behind environmental requirements, which are only taken into account by the biggest private groups; • Limited and fragile natural capital (water, forests, soil) and serious desertification • Risk of natural resources degradation and harm to human health (wastewater, waste, gas) 	<ul style="list-style-type: none"> • High EE and RE Potential • Huge impacts on environment and willingness to ease their magnitude • Willingness to preserve natural resources • Adaptation to CC effects • Need to improve socio-economic conditions of the poor populations 	<ul style="list-style-type: none"> • National strategy for sustainable development ; • National Plan for renewable energies and energy efficiency development ; • Energy management programme • National Programme for the integrated management of household and similar waste • National Programme for sanitation; • Programme for the development of a quality national system; • National research Programme; <p>S • support measures implemented</p>	<ul style="list-style-type: none"> • Algeria launched major national projects in waste management, sanitation and renewable energy management; • Adoption of a research and development policy ; • Experiences are developed in R&D by the biggest private industrial groups; • Major challenges are to be overcome with regard to industrial pollution abatement and the environmental upgrade of companies
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<p>Tunisia</p>	<ul style="list-style-type: none"> • High unemployment rate • Important regional imbalance • Limited and fragile natural capital (water, forests, soil) and serious desertification • Many pollution hot spots, mainly in coastal areas • Risk of natural resources degradation and harm to human health (wastewater, waste, gas) • Negative Energy balance 	<ul style="list-style-type: none"> • Democratic Transition • High EE and RE Potential • Huge impacts on environment and willingness to ease their magnitude • Willingness to preserve natural resources • Adaptation to CC effects • Need to improve socio-economic conditions of the poor populations 	<ul style="list-style-type: none"> • GE Strategy being developed • Programme for the EE and promotion of renewable energies (solar plan, financial incentives, thermal regulations) • Waste Management and valuation programme • Programme for the Environmental upgrade of companies • National sanitation Programme 	<ul style="list-style-type: none"> • Tunisia joined politically the promotion of green economy • Many projects were launched in this field • Companies use their means to get gradually involved in this new dynamics • The Democratic transition hampered the momentum in this regard
<p>Egypt</p>	<ul style="list-style-type: none"> • Huge population pressure • Low GDP/ capita • High poverty and unemployment rates • Limited and fragile natural capital (water, forests, soil) and serious desertification • Risk of natural resources degradation and harm to human health (wastewater, waste, gas) • Negative Energy balance 	<ul style="list-style-type: none"> • High EE and RE Potential • Huge impacts on environment and willingness to ease their magnitude • Willingness to preserve natural resources • Adaptation to CC effects • Need to improve socio-economic conditions of the poor populations 	<ul style="list-style-type: none"> • Promotion of renewable energies, especially wind and solar energy • Industrial pollution abatement project, EPAP 	<ul style="list-style-type: none"> • Significant initiatives were launched, in particular in the promotion of renewable energies and industrial pollution abatement • The search for a better anchoring of green economy fundamentals within companies will certainly be the next challenge.

6 - Recommendations

Based on the presentation and analysis conducted in the four North African countries (Morocco, Algeria, Tunisia and Egypt), it is obvious that green economy, although gradually beginning to settle, still suffers from large deficits at different levels. These deficits must imperatively be overcome to ensure the maximum opportunities for the emergence of this new form of economy as soon as possible, and thus contribute to a better management of the environment and to real participation in solving the major socioeconomic problems plaguing the region. The corrective measures that must be undertaken can be structured into five groups of recommendations as follows:

- **Political, strategic and programmatic recommendations**

This group of recommendations involves the formal willingness of the authorities to be effectively involved in the promotion of an integrated green economy at all development sectors. The political project initiated must be anchored in all departments, thus reaching the maximum number of actors. The green economy project must therefore be the foundation of the Government's overall policy in socio-economic development. Both programs will be consistent, until they reach total fusion. In the same vein, it is imperative from the start to redirect industrial policy towards goals in line with green economy.

Concretely, and after developing a national strategy to promote green economy in all four countries, it is necessary in a second time to integrate the foundations and principles of these strategies in socio-economic development policies and programs in all sectors and with all actors.

- **Regulatory Recommendations**

The development of a green economy lays on a regulatory framework adapted to its objectives. Specific standards and regulations should govern the different forms of production in all development sectors in order to reduce environmental impact and boost green economy. Simultaneously, governments must have strong control and monitoring tools to ensure proper implementation of this regulation.

A review / adjustment of the regulation is therefore essential. It must systematically penalize the infringements currently observed both in terms of pollutant emissions and overexploitation of certain environments and resources. Standards and limits must necessarily be defined and adopted to accompany the regulation to be implemented.

- **Financial recommendations**

Two types of tools are required in this area and would be good levers for the emergence and development of green economy. First, providing any party wishing to get involved in a green economy action with the appropriate and sufficient financial incentives through special funds created for this purpose; Second, the introduction of tax incentives to encourage and stimulate the products and services that comply the most with the principles of green economy. The funds currently available will be reinforced in this direction, adapted and developed to cover the maximum of practices that contribute to the promotion of green economy and especially the emergence of new businesses in the field.

- **Recommendations related to human capacity building**

All actors involved in green economy programs today (companies, business support structures), require significant capacity building to enable them perform their tasks properly and according to the accepted standards.

- **Recommendations in relation to companies' governance**

It would take shape through the generalization of environmental upgrading within the company and the development of a national platform for dialogue between the different actors involved in the process, government and private sector included, to exchange expertise and learn from the various experiences in the field.

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