Ministry of Foreign Affairs

Business Opportunities Report for Morocco's Renewable Energy Sector

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Business Opportunities Report for Morocco's Renewable Energy Sector

Netherlands Enterprise Agency – RVO



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Colofon

Netherlands Enterprise Agency (RVO), in collaboration with the Netherlands Embassy in Morocco, commissioned this study of the renewable energy sector in Morocco in light of the possible opportunities this sector presents for the Dutch private sector.

Photos Courtesy of Dr. Abdelbari Redouane

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Executive Summary

Morocco[1] is a front runner in Northern Africa and Africa as a whole, setting the pace by adopting the national renewable energy plan. The Moroccan energy market has been growing exponentially since 2009 and is progressively opening up to private investment. In 2015, Morocco's electricity generation capacity was 8,154 MW with the following mix: coal (31%), fuel oil and diesel (10%), hydropower (22%), gas (25.8%) and wind power (9.4%). A further 6,500 MW will be added by 2020, bringing the total electricity generation capacity up to 14,500 MW. Recent policy and regulatory changes have created an enabling environment for both foreign and national private sector players. These policy and regulatory changes have allowed private sector players to generate renewable energy and supply the national grid under guaranteed access provided by the national operator.

Of the different sources of renewable energy, i.e. solar, wind and hydro, solar photovoltaics (PV) and concentrated solar power (CSP) offer the best opportunity for investment in view of the government's high asiprations and plans for the sector. Moroccan Solar Plan has set a target of developing 2,000 MW of solar capacity by 2020, comprising solar PV and CSP. The onus is on the private companies in collaboration with the government through PPP to achieve this target by 2020. This commitment and the opportunities it provides matches Dutch expertise and knowledge.

In 2010, the Dutch solar energy market was relatively small. Driven by investment and innovation, the sector has since grown, with Dutch solar energy-related companies now being well-recognnised globally, along with their technology and innovation. The Dutch solar energy sector today has an annual turnover of about 2.5 billion euro.

Access to the Moroccan market must be a collaborative effort that involves the Dutch government and the relevant private sector stakeholders. This would facilitate access to projects in the Moroccan solar sector. For solar projects, MASEN (Morocco's Agency for Solar Energy) not only acts as the offtaker but also takes a miniority equity stake in projects. MASEN also provides debt financing for the Independent Power Producers (IPPs) through multilateral agency funds borrowed by the Moroccan government. This multiplicity of roles serves not only to secure Morocco's interests in the project but also to ensure that project developers, often private foreign firms, secure post-tender financing to build the projects[2].

The proposition is for the Dutch private and public sector to focus on interventions related to solar energy. It is advisable for the Dutch government to enter into Bilateral Technological Collaboration agreements and partnerships, where possible, with entities such as IRESEN, ONEE and MASEN. Such strategic alliances would facilitate better access to the Moroccan renewable energy sector for Dutch companies.

[1] Western Sahara is listed as a non-self-governing territory under Article 73 *e* of the Charter of the United Nations. Any reference in this report to (the cities in) the Western Sahara should be read in this context. For more information:https://www.rvo.nl/onderwerpen/internationaal-ondernemen/landenoverzicht/marokko/westelijke-sahara

[2] "Masens's NOOR solar energy project," Norton Rose Fulbright, June 23, 2016 https://www.insideafricalaw.com/publications/masen-s-noor-solar-energy-projects

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List of Acronyms

ADA	Agricultural Development Agency
ADEREE	National Renewable Energy and Energy Efficiency Development Agency
AFD	African Development Fund
AMDI	Moroccan Investment Development Agency
AMEC	Association of Internationalised Industrial Companies (Spain)
AMEE	Moroccan Energy Efficiency Agency
AMELEC	Association of Export Companies (Spain)
AMISOLE	Moroccan Association of Solar and Wind Power Industries
ANIE	National Trade Association for Electronic and Elictrical Companies (Italy)
ANRE	National Electricity Regulatory Authority
APM	A.P. Moller-Mersk
BA	Bachelor of Arts
BOOT	Build Own Operate and Transfer
CGEM	General Confederation of Moroccan Enterprises
CHP	Combined Heat Power
CMPP	The Moroccan Centre for Cleaner Production
CNAM	Conservatoire national des arts et métiers (University in France)
CNDP	National Commission for the control of Personal Data protection
CNEA	National Committee of Business Environment
CSP	Concentrated Solar Power
MW	Mega Watts
DAF	Doorne's Aanhangwagen Fabriek
EDF	Electricite de France
EE	Energy Efficiency
EPC	Engineering, Procurement and Construction
EU	European Union
FDE	Energy Development Fund
FDI	Foreign Direct Investment
FEE	Energy Efficiency Fund
FENELEC	National Electricity, Electronics and Renewable Energy Federation
FER	Renewable Energy Fund
FIT	Feed-in Tariff
FMO	Netherlands Development Finance Company
GDP	Gross Domestic Product
GIZ	German Agency for International Cooperation
GME	Gazoduc Maghreb-Europe
GTZ	Germany Agency for Technical Cooperation
HCP	High Commission for Planning
IEA	International Energy Agency
ICSID	International Centre for Settlement of Investment Disputes
IMF	International Monetary Fund
IRESEN	Institut de Recherche en Énergie Solaire et Énergies Nouvelles
IWPPs	Independent water and power producers
KfW	German Development Bank
KSA	Kingdom of Saudi Arabia

LNG	Liquid Nitrogen Gas
MAD	Moroccan Dirham
MAPMDREF	Ministry of Agriculture, Fisheries, Rural Development, Water and Forests
MASEN	Moroccan Agency for Sustainable Energy
MEF	Ministry of Economy and Finance
MEMDD	Ministry of Energy, Mining and Sustainable Development
MIGA	Multilateral Investment Guarantee Agency
MIICEN	Ministry of Industry, Investment, Trade and the Digital Economy
MP	Popular Movement
MTOE	Million Tonnes of Oil Equivalent
NWM	Nador West Med
OCP	Office Cherifien des Phosphate
OECD	Organisation for Economic Cooperation and Development
OEM	Original Equipment Manufacturers
OMPIC	Office of Industrial and Commercial Property
ONEE	National Office for Electricity and Wate
PAM	Authenticity and Modernity Party
PAREMA	Moroccan-German Energy Partnership
PERG	Rural Electrification programme
PJD	Justice and Development Party
NIWP	National Integrated Wind Project
PPA	Power Purchase Agreement
PV	Photovoltaics
RECAP Net	International Resource Efficient and Cleaner Production network
RESEN	Institut de Recherche en Energie Solaire
RGPH	National population and housing census
RNI	National Rally of Independence
SARL	Limited Liability Companies
SARLAU	Single Member Limited Liability Companies (one-person companies)
SDL	Local Development Cooperation
SIAM	Salon International de l'Agriculture au Maroc (Agricultural Show)
SIE	Energy Investment Company (Société d'Investissements Énergétiques)
SMEs	Small and Medium Enterprises
SNI	Société Nationale d'Investissement
TOE	Ton of Oil Equivalent
TTA	Tanger-Tétouan-Al Hoceima
UAE	United Arab Emirates
UAE	United Arab Emirates
UK	United Kingdom
UN	United Nations
UNCTAD	United nations Conference on Trade and Development
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Development Organisation
USA	United states of America
USFP	Social Union of Popular Forces
UTE	Union Technique de l'Electricité et de la Communication
VAT	Value-Added Tax

1. Introduction

1.1 Context

1.1.1 Country profile

Part of the westernmost region of North Africa, Morocco[3] is also known as 'Al Maghreb' in Arabic, literally meaning 'the West'.

Table 1: General information

GENERAL INFORMATION	
Area	710,850 Km^2
Institutional system	Constitutional monarchy
Capital	Rabat
Economic Capital	Casablanca
Climate	Mediterranean
Time Zone	GMT (GMT+1 in summer)
Official language	Arab
Languages commonly used	French, Spanish
DEMOGRAPHY	
Population	34.5 million inhabitants
Density	80.1 persons/km^2
Activity rate population	47.4%
Urban population	60%
Life expectancy	72 years
CURRENCY	
Currency	Moroccan Dirham (MAD)
EUR 1	MAD 10.93 (average Nov. 2016 – Nov. 2017)

Population: Morocco has a population of around 35 million people. Intermarriage between different social cultural groups is common, as is intermarriage with various other sub-Saharan African minorities. This has blurred ethnic differences through the centuries. There are, however, cultural divisions between cosmopolitan coastal regions, where European and Arab cultures tends to play a strong role, and the country's Berber and Sahara-dominated interior locales. The country has had a strong Jewish presence for many years (at one point the local Jewish community was 250,000 strong) though a substantial percentage of this population moved to Israel and Western Europe after 1948. Mellahs, the historic Jewish quarters that can be found in many of the Kingdom's cities, have distinct wall and fortified gates.

The country's central geographic location has resulted in a rich culture and 3,000-year history of privileged relations with Europe and other nearby regions. Morocco's population is relatively young;

[3] Western Sahara is listed as a non-self-governing territory under Article 73 *e* of the Charter of the United Nations. Any reference in this report to (the cities in) the Western Sahara should be read in this context. For more information:https://www.rvo.nl/onderwerpen/internationaal-ondernemen/landenoverzicht/marokko/westelijke-sahara

approximately 29% of the population is below 15 years of age, while 65% is between 15 and 65, and around 6% is over 65. Average life expectancy has risen to 70 years for men and 74 years for women.

According to the latest national population and housing census (RGPH 2014) [4], the overall illiteracy rate in Morocco is 32% of which for men it is 22% and women 42%. Ten years ago the overall illiteracy rate was 43%. Besides a gender difference in illiteracy rates, there is also a large divide between the rural and urban areas in Morocco. The illiteracy rate in the urban areas is 23% compared to 48% in the rural areas. The share of people in the age of 10 years+ who have attended higher education (minimum BA-level) is 6% compared to almost 9% ten years ago.

Morocco has rapidly been transforming into a largely urban society over the past decade, with approximately 60% of citizens now living in cities and urban areas, due to a trend of rural migration to coastal centres. The high population growth rate in urban agglomerations in recent years is accompanied by a rise in unemployment with pressures mostly felt by younger generations. The trend of urban migration is partly fueled by the dwindling appeals of rural life and the higher standard of living perceived in the cities. The influx of Morocco's increasingly young population into urban areas, especially those located on the country's Atlantic seaboard, feeds a significant informal employment sector, which has been a focal point of the government's current long-term reform and legislative agenda.

Languages: There are at least four languages in regular use around the country, making Morocco a multi-lingual Kingdom. Many locals know numerous foreign languages. Classical Arabic is the country's official language, but its local dialect, Darija, is the most commonly used in everyday life. Darija differs from classical Arabic in both pronunciation and vocabulary, and it can have additional local influences in different regions of the country.

Berber is widely spoken in different regions in the country; an estimated eight million people use Berber daily. French is still extensively spoken, especially among influential foreign-educated classes, older generations and in the big urban centres. Spanish is widespread in the northern regions of the country, but French remains the favorite language for business, science and in higher education. English and German is also spoken in far smaller proportions, and mainly in connection with tourism and in large cities, such as Marrakech and Agadir.

Religion: The great majority of Moroccans are Sunni Muslims and followers of the local Malekite rite, which is principally known for its focus on tolerance. The King is considered to be "commander of the believers" and Morocco's top religious authority. Sufism is also widespread, and there are numerous Sufi holy places and festivals. Morocco was home to one of the world's largest Sephardic Jewish populations prior 1948, but emigration has sharply lowered numbers to around 4,000, down from around 250,000 prior the birth of Israel. The remaining community is still economically and politically influential, and the Moroccan Jewish Diaspora has been a powerful ally in foreign relations

[4] Every ten years the national population and housing census RGPH (RECENSEMENT GENERAL DE LA POPULATION ET DE L'HABITAT) is carried out by the National Statistics Bureau of Morocco HCP.

with the EU and the US. Christianity is practiced primarily by the country's European residents and by a growing community of sub-Saharan African immigrants.

Geography and Climate: Morocco offers a wide range of geographic diversity, with a total area of 710,850 km^2. The country rich soil and mild climate have resulted in thriving local agriculture sectors. The Kingdom is spread over four topographical zones: the Atlas and the Rif mountain ranges to the north, reaching altitudes of 4,165 meters; the fertile coastal plains to the west; the drier Anti-Atlas region in the centre; and the Sahara desert to the south. The total length of Morocco's Mediterranean and Atlantic coastlines is 3,500 km. To the north, the Strait of Gibraltar separates North Africa from Europe by a mere 17 km at the narrowest point, making neighboring Spain easily visible most days.

Morocco has a Mediterranean climate. Rainfall is concentrated in the winter months, in line with northern hemisphere weather patterns. Most of the rainy conditions come off the Atlantic Ocean buffeting the coastal regions with rains and strong winds. The hot and dry summer months see temperatures as high as 40°C throughout the country and even higher in some remote inland regions. The Atlas is temperate and generally accounts for most of the country's snowfall during the winter months. The southern and Anti-Atlas regions are predominantly desert climates sprinkled with several lush oasis areas.

1.1.2 Foreign companies

During the last eight years Morocco has become a main destination in Africa for foreign investors. In 2016 alone 81 greenfield foreign direct investment (FDI) projects were announced with a total value of almost USD 6.6 billion. The highest number and value since 2009. The share of Morocco in greenfield foreign direct investments in North Africa was 12% in 2016 compared to 20% in 2015 making it second after Egypt. Morocco's share in Africa's greenfield FDI projects was 7% in 2016.

Table 2: FDI related projects

	2009	2010	2011	2012	2013	2014	2015	2016
Number of announced Greenfield[1] FDI projects	**50**	**55**	**96**	**68**	**51**	**75**	**74**	**81**
Value of announced Greenfield FDI projects (million US$)	**6,840**	**2,445**	**2,921**	**1,203**	**2,649**	**5,203**	**4,357**	**6,596**
% in Africa	**8**	**3**	**4**	**2**	**4**	**6**	**6**	**7**
% in North Africa	**17**	**13**	**24**	**7**	**22**	**20**	**20**	**12**

Note: ***(1)*** *Green Field Investments are a form of Foreign Direct Investment where a parent company starts a new venture in a foreign country by constructing new operational facilities from the ground up.*

Source: ***UNCTAD***

The majority of foreign companies investing in Morocco are coming from the EU – mainly France and Spain – but increasingly from the Middle East (mainly United Arab Emirates). Also companies from the USA show a growing interest in investing in the Kingdom in recent years. Although the Netherlands has a large Moroccan Diaspora, only a relatively few number of Dutch companies are investing in Morocco. During the last twelve years of the total volume of foreign direct investments

in Morocco less than 1% came from Dutch companies. It is estimated that around 60 – 70 Dutch companies are located in Morocco through either a Joint Venture with a local partner, a local agent or an affiliate. Most of these companies are active in agriculture and related business activities and have less than 250 employees (i.e. belonging to SMEs). In 2016 total FDI stock from the Netherlands in Morocco amounted to just over five-hundred million euros. Large(r) Dutch companies active in Morocco are among others Heineken, DAF, Unilever, Philips, Klaas Puul, The Makers and APM. Agricultural companies active in the Kingdom are among others Enza Zaden, Messem, Van Oers, and Koppert. The number of Dutch transport and logistics companies active in or on Morocco is estimated between 15 – 20, although exact numbers are not available due to a missing database of (such) Dutch companies.

2. Moroccan Business Climate

2.1 Political environment

The Kingdom of Morocco is a constitutional monarchy based on French and Islamic law and French legal procedures. A new constitution came into force on July 1 2011. King Mohamed VI is the head of state.

The country has a bicameral system, consisting of a directly elected 395-seat lower Chamber of Representatives and a 120-seat upper Chamber of Advisers indirectly elected by an electoral college. Representatives are elected every five year by universal suffrage. The last election for the lower house was held in October 2016 which was won by the PJD (Justice and Development Party). Voter turnout is relatively low in Morocco. During the elections of 2016 voter turnout was 43%, in 2011 it was 45%.

The Kingdom has undergone some significant changes in recent years, including closing the gender gap, tackling poverty and slowly decentralising its government. The manner in which it has gone about implementing these reforms has ensured that political risk is kept at a minimum. This has been achieved thanks in large part to the strong executive authority of the King.

The King, who also holds the title of the Commander in Chief as the country's military leader and Commander of the faithful as the country's religious leader, appoints the Prime Minister following parliamentary elections. With the Prime Minister's recommendations, the King then appoints the other members of government. In the event of legislative gridlock, the King has the power to dissolve parliament and call for new elections. Similarly, the monarch can dismiss a minister from office if he feels it is appropriate.

While power is consolidated at the highest levels of the monarchy, moves have been made to expand the authority of parliament in recent years, following a number of amendments to the constitution in the early 1990s. The changes have, among other things, given elected officials greater responsibility for a range of issues, including budgetary and investigatory matters. Additionally, the Chamber of Representatives has been given the authority to dissolve the cabinet though to a vote of no-confidence.

Main political parties (seats won during parliamentary elections in October 2016)

- **PJD** (Justice and Development Party) 125 seats
- **PAM** (Authenticity and Modernity Party) 102 seats
- **Istiqlal** (Independence Party) 46 seats
- **RNI** (National Rally of Independence) 37 seats
- **MP** (Popular Movement) 27 seats
- **USFP** (Social Union of Popular Forces) 20 seats
- Other parties 38 seats

National elections

Last elections: October 2016 (Chamber of Representatives); October 2015 (Chamber of Advisers); September 2015 (municipal and regional councils). Next national elections: October 2020 (Chamber of Advisers); October 2021 (Chamber of Representatives).

Judiciary System

The judiciary system is based on a combination of Islamic law and European civil law, and is headed by the Supreme Court. Judges to the high court are appointed by the Supreme Council of the Judiciary, which is led by the King. There are five Chambers in the Supreme Court: constitutional, penal, administrative, social and civil. The constitutional chamber has the authority to review legislation.

Women's Rights

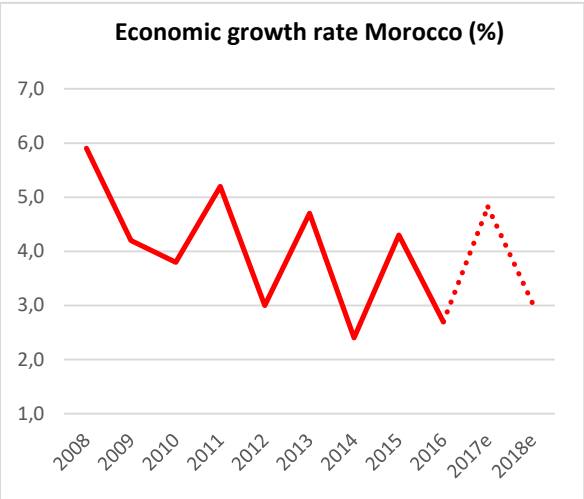
Among some of the biggest reforms passed under King Mohammed VI has been that of the family code (Moudawana) a legislative overhaul aimed at reducing the gender gap and strengthening the rights of women. The Moudawana largely closed the door on polygamy, enabling women to file for divorce without their husbands' approval, making the decision subject to a court ruling. Similarly, the legal age for marriage for girl was raised from 15 to 18. The new legislation also codified family responsibility as being within the domain of both spouses. Finally, the nationality code was amending to grant Moroccan women married to foreigners the right to pass on citizenship to their children. The Moudawana was one example of how the Kingdom sought to build upon its reputation of a progressive social legislation, but reforms such as this have had more than a simply symbolic effect. The commitment of leaders to protecting the rights of women can be seen in the increasingly active role women play in determining the social, political and economic agenda of the country, women now holding a number of significant positions in private sector.

2.2 Economic developments

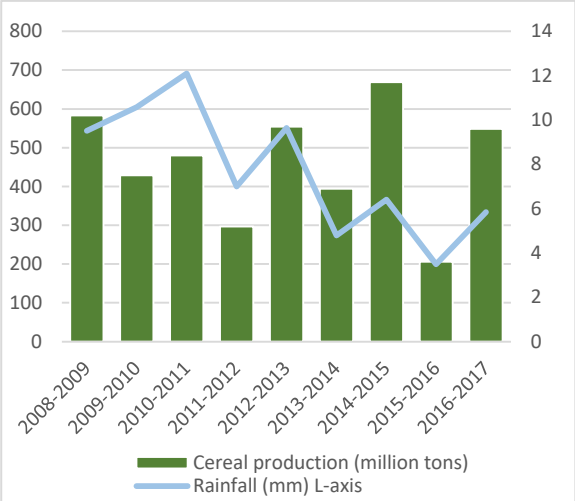
During the last fifteen years Morocco's annual economic growth rate was on average 4%. At the same time growth rates fluctuate widely between succeeding years. These fluctuations are the result of the strong influence in performance of the agricultural sector (including forestry and fishery). With a share of 14% in GDP and almost 40% in total (formal) employment, fluctuations in agricultural output due to (severe) weather conditions have a relatively huge impact on the economic development of the country. One of the main staple food are cereals. Cereal production during the past eight years has fluctuated sharply due to the amount of rainfall in a particular season. In the agricultural seasons of 2008/09, 2012/13, 2014/15, and 2016/17 cereal production was with more than nine million tons high at the time that annual rainfall was above the long-term average of around 327 mm. The opposite is the same; below average rainfall led to low cereal production creating a drain on many peoples income. The result is that economic growth in those years with relatively low agricultural production slowed down as well. For example the years 2012, 2014, and 2016 showed below average economic growth rates and had at the same time low agricultural output. For 2017 the International Monetary Fund (IMF) expects a relatively high economic growth rate of 4.8%. For 2018 it is expected that the growth rate will fall back to around

3.0%. The expected high growth rate for 2017 is primarily caused by a strong performance of the agricultural sector during the season 2016 – 2017.

Figure 1: Morocco's economy

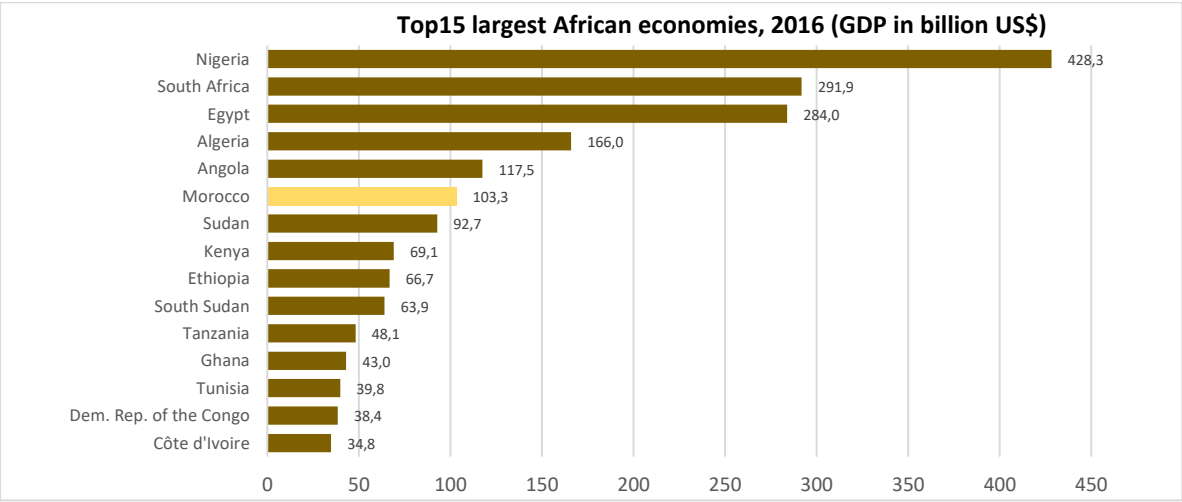


Note: (e) estimate by IMF
Source: HCP Maroc, IMF



Note: The agricultural season begins in September and ends in May of the following year
Source: Ministry of Agriculture, HCP Maroc

The relatively high average economic growth rate of 4% during the past fifteen years has resulted in the fact that Morocco's economy with an overall GDP of USD 103 billion in 2016 is number six in Africa. But with a GDP per capita of less than USD 3,000, Morocco has the lowest income level in North Africa. This is primarily caused by the large influence of the agricultural sector in Morocco, which has traditionally a relatively low value added compared to manufacturing or construction.



Source: UNCTAD
Figure 2: Top 15 largest economies in Africa

Within Morocco income per capita divers widely between regions. Moreover, income levels along Morocco's western coastline are among the highest in the country whereas in the eastern provinces

near the Atlas mountains income levels are well below the national average. Income disparity is growing as investments by public and private actors are unevenly distributed across the country.

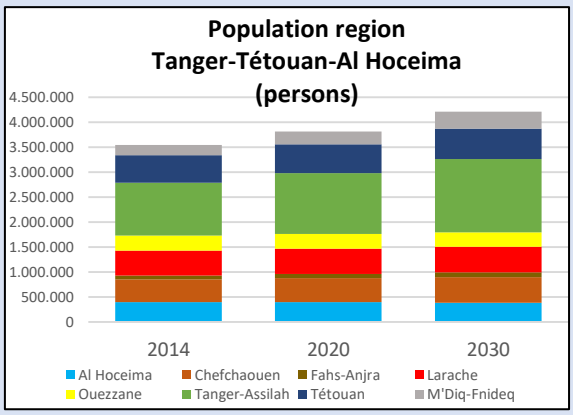
The volume of investments by public enterprises, a main source of investments, by region shows an overwhelming preference for the two most populated regions in the Kingdom namely Casablanca – Settat and Rabat- Salé. These two regions combined receive more than half of the total investment budget from Moroccan state companies. A trend which has been seen during the last couple of years.

Socio-Economic situation region Tanger-Tétouan-Al Hoceima

The size of the population in the northern region Tanger-Tétouan-Al Hoceima (TTA) is around 3.5 million people or about 11% in Morocco's total population in 2014. It is expected to increase to 3.8 million people by 2020 and 4.2 million people by 2040. Of the population 60% are living in urban areas and 58% is younger than 30 years. The largest province in this region is Tanger-Assilah with a total population of over one million people in 2014, which will further rise to an expected 1.5 million people by 2030. The province Al Hoceima has currently around 400,000 people and its population is expected to decrease to around 385,000 people by 2030. The drop in overall population in the province of Al Hoceima is caused by a decrease in the size of the rural population during the next twenty years.



Region Tanger-Tétouan-Al Hoceima



Source: HCP

According to Morocco's national statistical office HCP, the regional GDP of the region TTA was about 99.3 billion dirhams (approximately 9.1 billion euros) in 2015 or a share of 10% in the national GDP of 988 billion dirhams (approximately 90.6 billion euros). This was an increase of 7.9% compared to 2014. Looking at the average GDP per capita for the region TTA, it is with almost 28,000 dirhams 4% below the national level. Compared to 2010, regional GDP per capita has risen with 22% which is comparable with the increase in the national average. The main economic sector in the region is agriculture followed by industry. With 878 industrial companies, representing around 11% of the total number of industrial companies located in Morocco, the region of TTA contributes 7% to industrial exports, 11% to the total industrial workforce, 7% of total industrial production and 25% of total investments in industry. Within the region TTA there is an economic imbalance. About 80% of industrial activities are located in the prefecture Tanger-Assilah.

The official unemployment rate in the region of TTA is 14.9% of the labour force, which is below the national average of 16.2%. In the provinces of Tanger-Assilah (15.1%) and Al Hoceima (16.3%) the unemployment rate is above the regional level. The monetary poverty rate[5] in the region TTA is 2.6% compared to 4.8% nationally. The highest poverty rate is in the province of Fahs-Anjra (5.47) followed by Larache (5.33).

2.3 Foreign trade and Foreign Direct Investments

Due to her strategic geographical location between Europe and Africa, Morocco's foreign trade plays a significant role in the development of the country. During the last six years total foreign trade has increased steadily from a level of around 448 billion dirhams (EUR 41.1 billion) in 2010 to over 600 billion dirhams (EUR 55 billion) in 2016. This increase of around 30% is mainly caused by a stronger rise in imports than exports. In recent years Morocco has been importing goods at a higher level than it exports resulting in a continuous trade deficit of around 190 billion dirhams (17 billion euros). With a share of two-thirds in Morocco's total foreign trade, the European Union is the most important trading partner. Looking at individual countries, France and Spain are Morocco's largest trading partners for many years now followed by China and the USA. The Netherlands has a share of 2% (12.7 billion dirhams ~ 1.16 billion euros) in total foreign trade, making it number eleven of Morocco's main trading partners. Morocco imports more from the Netherlands than it exports resulting in a trade deficit of 2.9 billion dirhams (approximately 266 million euros) in 2016. The main import products from the Netherlands are fuel products (diesel, oil), commercial vehicles, and seed oil. Main export products to the Netherlands are phosphoric acid, agricultural products (e.g. citrus fruits, vegetables), and canned fish and vegetables.

Table 3: Foreign Trade Partners

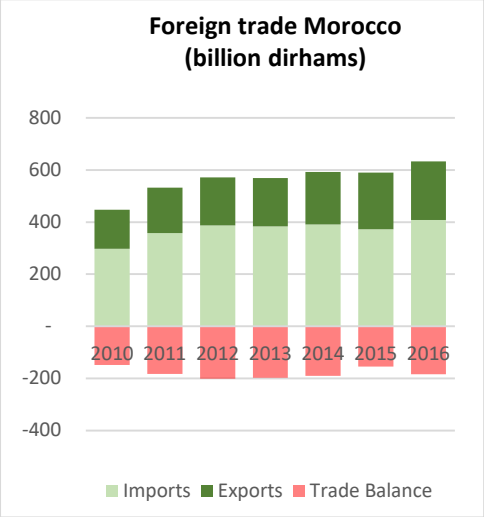
Country Top 20	***% in foreign trade Morocco 2016***	***% in foreign trade Morocco, 2010***
Spain	18.4%	12.7%
France	16.0%	17.9%
China	6.3%	6.0%
USA	5.3%	5.9%
Italy	5.1%	5.5%
Germany	4.8%	4.1%
Turkey	4.0%	2.1%
Portugal	2.4%	1.5%
UK	2.3%	2.4%
India	2.2%	3.1%
The Netherlands	2.0%	2.1%
Brazil	1.9%	2.7%
Russia	1.9%	2.9%
Belgium	1.5%	1.8%

[5] The monetary poverty rate is the proportion of poor people in total population whose per capita income is below the poverty line. The threshold is set by the Moroccan government at 4667 dirhams per person per year in urban areas and 4312 dirhams per person per year in rural areas.

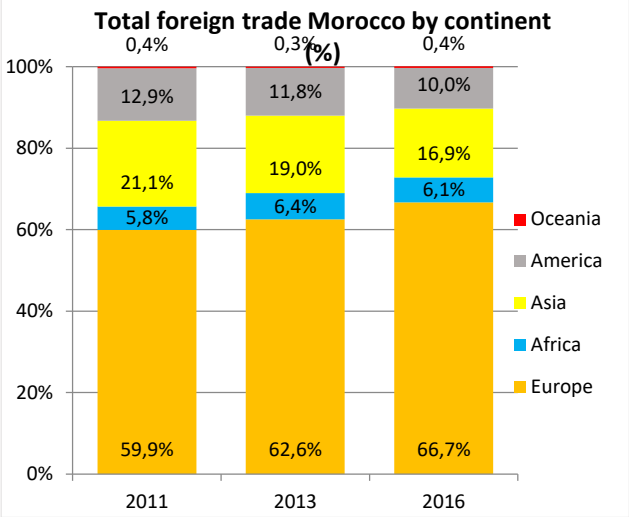
Saudi Arabia	1.4%	4.0%
South Korea	1.4%	1.0%
Algeria	1.3%	1.8%
UAE	1.2%	0.6%
Romania	1.2%	0.4%
Japan	1.1%	1.1%

Source: Office des Changes Maroc

Africa is becoming more of an important trading partner for Morocco. During the last five years King Mohammed VI travelled to many African countries to promote and stimulate foreign trade and investments between Morocco and the rest of Africa. This has resulted in a significant increase in Moroccan companies from the public and private sector to look for new business opportunities on the African continent. Specifically companies who are active in real estate, construction, mining, finance, and telecom. Countries in Western Africa are their main target. In 2016 almost 60% of Morocco's foreign trade with Africa was with West African countries followed by East Africa (16%). This has resulted in the fact that Morocco has become the largest African trading partner for countries like Cote d'Ivoire, Senegal, and Mauritania. In that regards, Morocco has becoming more and more of a regional trading hub for (francophone) West Africa.



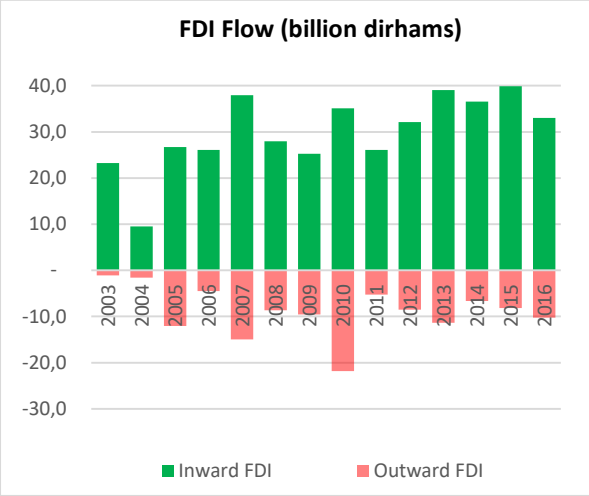
Source: Office des Changes Maroc



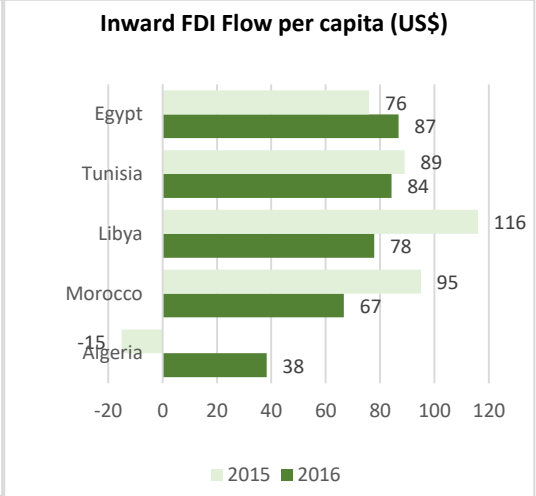
Source: Office des Changes Maroc

Figure 3 : Foreign Trade, Morocco

The flows of Foreign Direct Investments (FDI) into Morocco has been more or less stabilising between thirty and forty billion dirhams (approximately between 2.8 – 3.7 billion euros) annually during the last six years. Outward flows in FDI is relatively low. With the exception of the year 2010 it has been below eleven billion dirhams (approximately one billion euros) per year since 2008 resulting in a net flow of FDI in 2016 of 22.8 billion dirhams (2.1 billion euros). In 2015 it was 31.8 billion dirhams (2.9 billion euros) due to a larger volume of inward FDI.



Source: Office des Changes Maroc

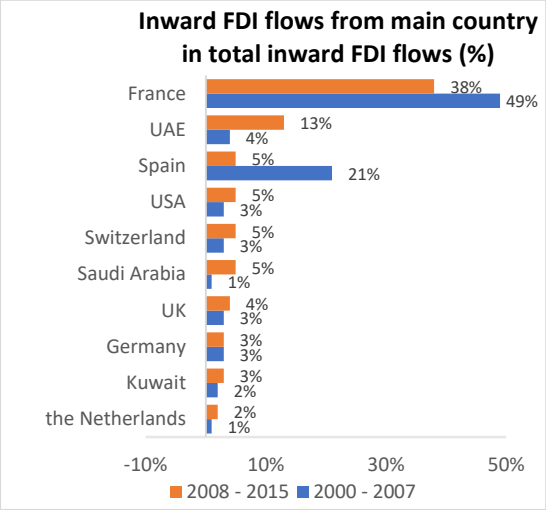


Source: UNCTAD

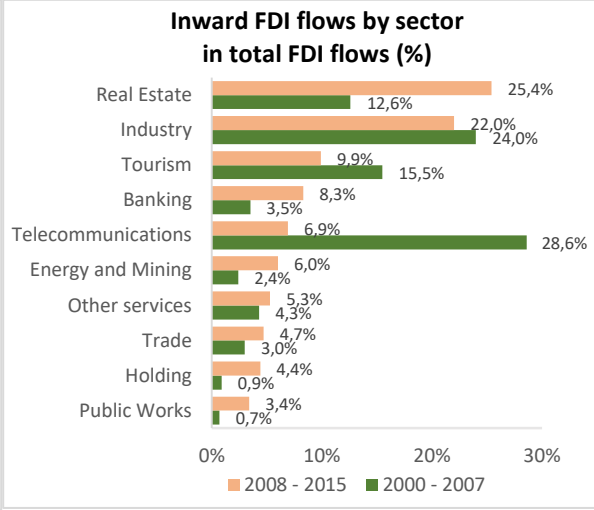
Figure 4 : FDI Morocco

Compared to neighbouring countries in Northern Africa, Morocco's level of per capita inflow of foreign direct investments in 2016 was USD 67 which was much lower than the levels received by Egypt, Tunisia and Libya. Only Algeria had a lower level of FDI per capita received. In 2015 Morocco was among the top receiving countries in Northern Africa. The largest foreign investor in Morocco is France with a share of 32% in total inward FDI followed by UAE (12%) and Saudi Arabia (11%). The Netherlands is a relatively small foreign investor in Morocco with a share of around 3%.

Looking at the last fifteen years of FDI flows in Morocco, there is a shifting trend in the origins of the main foreign investors. During the first eight years of this millennium France and Spain were the two largest investors followed at a distance by other European countries. During the subsequent period of eight years Spain saw its share in total FDI flows tumbling from 21% to only 5%. Also France saw its share decreasing although it remains by far the largest foreign investor in Morocco. New investors are mainly coming from the USA and the Middle East like the United Arab Emirates (UAE) and Saudi Arabia. In 2014 UAE and Saudi Arabia were the second and third largest foreign investors in Morocco. In 2015 and 2016 these two countries together with Qatar strengthen their investment position in the Kingdom. The share of the Netherlands in FDI flows to Morocco doubled and reached 4.5% or around one billion dirhams (around EUR 90 million) in 2016. This makes the Netherlands among the Top10 foreign investors in Morocco. FDI stock from the Netherlands in Morocco amounted to EUR 514 million in 2016, a decrease of 22% compared to 2015. One of the main private investments done by a Dutch company in recent years is the construction of a new shrimp factory for Klaas Puul in Tanger with a total investment of fifteen million euros in 2014. Also in 2014 Dutch financial institute FMO provided a loan of EUR 1.5 million to the Dutch clothing manufacturer The Makers based in Tanger to relocate their production facility to another free zone in the city.



Source: Ministry of Finance

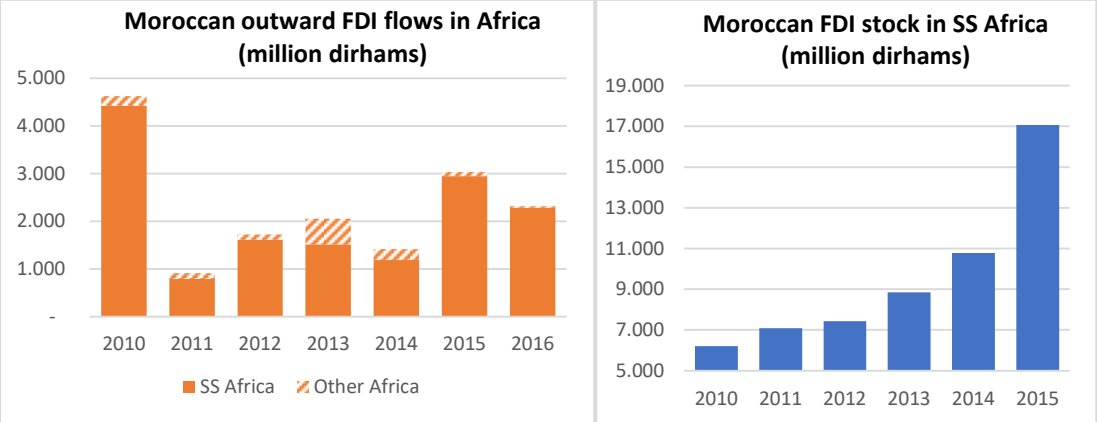


Source: Ministry of Finance

Figure 5: FDI Morocco

During the last eight years the economic sectors receiving the largest shares in foreign direct investments were real estate and the rapidly growing high-tech manufacturing industry (cars, aeronautics, food processing, etc.). Tourism and the banking sector (banking, insurance) followed with respectively 9.9% and 8.3%. The share of FDI in Morocco's transport sector during the last eight years was relatively small (less than 3%). The drop in FDI in the telecommunication sector is significantly. During the first eight years of this millennium telecommunications received the highest share in FDI, but in the following eight years it dropped to 6.9%. One of the reasons for this drop is the fact that during the first decade of this millennium Morocco invested strongly in the development of industrial parks aimed at attracting foreign telecommunications and IT companies to set up business in the Kingdom as part of their global outsourcing or offshoring strategy. Industrial park Casanearshore (Casablanca) is a good example of that trend. It opened up in 2007 and attracted foreign companies like Oracle, SAP, and Altran. During the last eight years Morocco's strategy is more at attracting foreign companies active in automotive, aeronautics, and renewable energy.

Morocco's relationship with Africa has been growing over de last five years. Not only foreign trade has increased significantly, but also more Moroccan companies are investing in Africa especially in Sub-Saharan Africa. Of Morocco's total outward FDI flows to Africa roughly 90% goes into Sub-Saharan Africa. That is over 50% of total Moroccan FDI outflows between 2008 and 2016. Main recipients of receiving Morocco FDI flows in 2016 were the (French speaking) West African countries Côte d'Ivoire, Cameroun, Senegal, Guinee, and Benin. But also other Sub-Saharan African countries like Congo, Chad and Togo have seen increased flows of foreign direct investments from the Kingdom. Concerning Moroccan FDI stock in Sub-Saharan Africa, it almost tripled from MAD 6.2 billion in 2010 to MAD 17 billion in 2015.



Source: Office des Changes Maroc

Figure 6: FDI in Africa

Looking at Moroccan FDI stock by economic sector in Sub-Saharan Africa, it is dominated by investments in the banking sector (40%), followed by telecommunications sector (34%), insurances (13%) and industry (6%).

2.4 Trade and foreign investment regulations

2.4.1 Laws and Regulation

Aware of the fact that investment is a key factor to ensure sustainable and sustained economic growth, Morocco has liberalised its economy by easing procedures, providing better protection to private operators through introducing new laws aiming at improving investment conditions and, thus, acquiring significant flow of domestic and foreign private capital, including:

Labour code: This Code matches the basic principles set by the Constitution and international standards as spelled out in the UN conventions and its specialised organizations in connection with the work field.

The protected rights include:

- Trade union freedom and effective adoption of the right to organise and to bargain collectively;
- Prohibition of all forms of work coercion;
- Effective abolition of child labour;
- Prohibition of discrimination in terms of employment and professions;
- Equal wages.

Copyrights

The law on copyright and related rights anticipates measures that aim, on the one hand, to strengthen and modernise the protection system for creators and works and on the other to harmonise national legislation with commitments made by Morocco as part of International treaties

and agreements. The Moroccan Office of Industrial and Commercial Property (OMPIC)[6] under the Ministry of Industry and Communications is responsible for the protection and exploitation of copyright and its sister rights.

Industrial property

The law on the protection of industrial property anticipates provisions for a brand opposition system as well as for border measures to control merchandise suspected of being counterfeit. It also covers the protection of sound signals and brand smells, and includes the deposit of brands in electronic format. What is more, as a signatory of international treaties on industrial property Morocco has many advantages. These include a strengthened legal framework that protects industrial property rights for both national and foreign investors and conformity to the highest international standards in the field. The formalities for protecting the rights of Industrial and Commercial Property and applying international and national legislation are made at OMPIC.

Freedom of pricing and competition

The 06-99 Law on free pricing and competition sets the rules for the protection of competition and aims to boost economic efficiency, improve the welfare of consumers and ensure transparency and fairness in trade relations. The Competition Council is the body responsible for ensuring transparency and fairness in economic relationships, through the close analysis and regulation of market competition. It achieves this by attentively checking anti-competition and disloyal business practices as well as any operations that increase economic concentration and monopoly.

Personal data protection

The Law on the protection of individuals with regard to processing of personal data introduced a set of legal provisions aimed at protecting the identity, rights and individual and collective freedoms as well as privacy against all attacks that may affect them through use of computers. The Law defines, among others and with precision, the right of access to databases containing personal data, to object to certain treatments, to request correction of erroneous data and delete outdated information or those whose purpose of treatment was performed. The CNDP (National Commission for the control of Personal Data protection) is responsible for verifying that personal data is handled in an approved, legal way and its use does not carry a risk to private lives, freedoms or fundamental human rights.

Arbitration & mediation

The arbitration legal arsenal is characterised by a series of innovations aimed at harmonising the Moroccan trade law with international principles. Among the novelties of this paper are broadening the scope of arbitration to legal entities under public law. The implementation of the arbitration judgments relating to these acts remains however subject to the exequatur which returns to the administrative jurisdiction in the competence of which the judgment will be executed, or in the administrative court of Rabat, when the arbitration judgment concerns the whole national territory.

[6] OMPIC is the organisation in charge of industrial property protection (trademarks, patents, industrial designs) and maintaining of the central trade register in Morocco. OMPIC is a public institution with legal personality and financial autonomy. It is supervised by the Ministry of Industry, Trade, Investment and the Digital Economy.

The text also gives the tribunal the right to rule, either automatically or at the request of either party, on the validity or limits of its powers, or the validity of the arbitration agreement. It can also take, at the request of either party, any interim measure it deems necessary within the limits of its mission. This law has also contributed to achieving an international quality of arbitration and provides conventional mediation as an alternative for resolving conflicts.

2.4.2 Free Trade Agreements

Within the framework of its global openness and liberalisation strategy, Morocco has set up during the last decade a legal framework conducive to developing its commercial relations with some of its potential partners, through the conclusion of free trade agreements either bilaterally or regionally.

Morocco-European Union association agreements
Nature of agreement: Association agreement
Date of signature of the agreement: February 26 1996
Entry into force: March 1 2000
Field of application: any sector of economic activity.

Morocco-United States Free Trade Agreement
Nature of agreement: Free Trade Agreement
Date of Signature of the agreement: 06/15/2004
Entry in force: 01/01/2006
Field of application: any sector of economic activity.

Morocco - EFTA Free Trade Agreement
Nature of the agreement: Free trade agreement
Date of Signature of the agreement: 06/19/1997
Entry in force: 03/01/2000
Field of application: Trade of goods

Morocco-Turkey Free Trade Agreement
Nature of agreement: Free trade agreement
Date of Signature of the agreement: 04/07/2004
Entry in force : 01/01/2006
Field of application: Trade of goods

Arab Free Trade Zone
Date of signature: 02/27/1981
Date of application: 01/01/1998
Field of application: All products originating and coming from the Arab states contracting, with the exception of the prohibited products excluded for sanitary, moral reasons, as well as for public security and preservation of the environment.

Morocco Arab Countries Trade Agreement
Date of signature : 02/25/2004
Date of application : 27/03/2007

2.4.3 Tax System

General Regime

Value-Added Tax (VAT)
In general, VAT arises when a services is performed, goods are delivered or, in case of imports, when clearance documents are filed with customs. Exports are exempt from VAT. The applicable VAT rates are as follows:

- 7% rate applies for some goods of general consumption, water, renting out of water and electricity meters
- 10% rate applies bank and credit transactions and exchange commissions except leasing, the supply of catering services and the activities of some professions (lawyers, interpreters)
- 14% rate is applies for transportation transactions, electrical energy, etc.
- 20% is the standards VAT rate applicable to transactions other than those subject to the reduced VAT rates mentioned above

Corporation Income Tax and Withholding Tax
Residency is the key of determining corporation taxation. Under territoriality rules relating to corporate tax, companies, whether resident in Morocco or not, are subject to corporate tax on all profits or income relating to goods or property they own, activities they perform or profit-making transactions they carry out in Morocco, even when these are occasional nature, or which the right of taxation is attributed to Morocco by virtue of a double tax treaty.

Also, non-resident entities receiving remunerations such as royalties, interest or other payments for work performed or services rendered to their permanent establishment in Morocco or branches or entities domiciled or performing activities in Morocco are taxed generally through withholding tax.

The normal corporate tax rate is 30% (37% for banks and insurance companies). It is 15% for companies with an annual turnover not exceeding 3 million dirham.

The withholding tax rate is 10% maximum on the distribution of dividends to non-resident shareholders and after tax profits to the branch's head office. Thus, total tax burden is 37% (30% + 0.7*10%) (43.3% for banks and insurance companies), though some double tax treaties signed by Morocco can reduce the withholding tax rate.

Taxable income is determined on the basis of financial statements obtained according to the generally accept Moroccan principles, with some adjustments relating to fiscal law. It should be note

that a minimum levy is also required by the fiscal law. The minimum levy in general may not be less than 0.5% of the sales with a minimum of MAD 1,500. However, the entity will not subject to its levy during the first 36 months following the commencement of operations.

Tax losses arising from normal business activities of the enterprise are deductible.
Losses may be carried forward four years.

Income Tax

Individuals who are tax residents in Morocco are liable for income tax on all their income derived in Morocco. Income tax is calculated by applying a progressive tax rate to the taxable income base. As a general rule, all types of remuneration and benefits received by an employee for services rendered are considered taxable income.

Each month, the Moroccan employer has to withhold and pay income tax to the Treasury on every payment to the employee.

Repatriation of profits and transfer pricing

In addition to paying interest and dividends, the payment of management fees, service fees and royalties are methods of repatriating profits to the non-resident associates, controllers and owners of Moroccan entities. In these circumstances, the payments made by the Moroccan resident to the non-resident associate must reflect the market value of the goods and/or services to the Moroccan company, that is all payment must has paid an excessive amount for the goods and/or services, the tax office can disallow the deduction claimed by the Moroccan company, and substitute an alternative price.

Other transactions between the Moroccan taxable entities (or branches), and their related foreign entities or head offices are also subject to the transfer pricing rules.

Foreign tax relief

Considering that a Moroccan resident is taxed on worldwide income, the Moroccan tax system provides relief from foreign taxes paid on such worldwide income by means of a foreign tax credit. This foreign tax credit cannot exceed the Moroccan tax otherwise payable in respect of the foreign-source income.

Withholding tax

Dividends paid to a non-resident are subject to a 10% withholding tax unless the rate is reduced under an applicable tax treaty. Interest on loans obtained from a non-resident is subject to a 10% withholding tax.

Royalties paid to non-residents are subject to a 10% withholding tax unless the rate is reduced under an applicable tax treaty.

Professional Tax

Professional tax applies to individual or legal entities, either Moroccan or non-Moroccan, which carry on professional activity in the Kingdom. Professional tax is determined on the basis of the gross rental value of the premises using leases and rent contracts, by comparison or direct appreciation performed by the tax authorities. There is a tax exemption for the first five years since the start of the activities.

Property Tax

Property tax applies to building used by their owners for primary or secondary residence or made freely available to their spouses, children and relatives for use. The tax is calculated annually by applying the property tax rate to the rental value of the building. New buildings acquired as a primary residence are exempt from property tax during the first five years and they also benefit from 75 precent reduction of the rental value thereafter.

Communal Tax

Communal tax applies to the land, buildings and equipment, and is levied on the rental value, as ascertained for professional tax or property tax as the case may be. The communal tax is established on the rental value at the rate of 10.5% for the buildings located in the vicinity of urban communes and delimited centres and 6.5% for the buildings located in the peripheral zones of urban communes.

Free Zones Tax System

Free Zones offer number of tax advantages such as:

- Exemption of taxes on dividends and partnership shares
- Corporate tax is 0% during the first five years and then a reduced rate of 8.75% starting at the 6th year applies, for the next 20 years
- Licence Tax & Urban Tax : exempted during 15 years
- Exemption of all registration taxes and stamp duties
- Exemption of VAT and tax-free repatriation of foreign earnings

Double Taxation Treaties

Morocco has signed double tax treaties with 39 countries, including with the Netherlands, US, a majority of the European countries, many Middle Eastern countries, some East Asian countries and some African countries.

2.4.4 Investment Incentives

In addition to the tax exemptions granted under the common law, Moroccan law provides specific financial, tax and customs advantages to investors, as part of agreements or investment NAREVAto be concluded with the State, provided that they meet the required criteria.

This concerns:

- The contribution of the state to certain investment expenses: Investment Promotion Fund;
- The contribution of the state to certain expenses for the promotion of investment in specific industrial sectors and the development of modern technologies: the Hassan II Fund for Economic and Social Development;
- Exemption from customs duties under Article 7.I of the Finance Act No. 12/98;
- Exemption from import VAT under Section 123-22 °-b of the General Tax Code.

These four advantages can be benefited from in a single investment project.

Investor Protection

International conventions relating to the guarantee and protection of investments

As part of foreign investment promotion efforts, Morocco has ratified international conventions relating to the guarantee and protection of investment. These include agreements on the establishment of :

- The International Centre for Settlement of Investment Disputes "ICSID"
- The Multilateral Investment Guarantee Agency "MIGA"
- The Inter-Arab Organisation for Investment Guarantee Corporation

Bilateral agreements and conventions relating to the guarantee and protection of investment

The promotion of foreign investment in Morocco is not only limited to the adherence to international multilateral conventions but extends to the bilateral ones, as part of strengthening relations with key partners. So many treaties, agreements and conventions for the promotion and protection of investments and avoidance of double taxation have been signed throughout the recent decades.

<u>Agreements and conventions related to promotion and investment protection</u>

The main provisions of these agreements and conventions concern the following aspects:

- Treatment of permitted investments
- Free transfer of capital and income
- The non-expropriation of investment, except for public utility reasons and following a court decision (on a nondiscriminatory basis and to pay a prompt and adequate compensation)
- Disputes with recourse to domestic courts or international arbitration at the choice of the investor

Non-double Taxation Agreements

Morocco has signed agreements with several countries to avoid double taxation with respect to income tax. These agreements establish the list of taxes and income concerned, the rules for mutual administrative assistance and the principle of non-discrimination.

Investor protection under the national law

Foreign investors benefits from a convertibility regime, which ensures that the investor has the right to:

- Carry out investment operations in Morocco;
- Transfer income produced by these investments abroad;
- Re-transfer income from the liquidation or sale of investments.

CNEA (Comité National due l'Environnement des Affaires)

In order to ensure a clear and transparent framework for investment for the benefit of national and international operators, the National Committee of Business Environment CNEA was created in December 2009. This high-level body is chaired by the Prime Minister. It is composed of representatives of public and private sectors and aims to identify and implement measures to enhance Morocco's attractiveness.

CNEA has become a Public-Private platform for Public-Private Dialogue on how to improve the Moroccan business environment and the image of the nation internationally.

2.5 Business environment

2.5.1 Introduction

Due to various economic reforms in recent years, Morocco's business environment has improved considerably. According to the World Bank Ease of Doing Business Index 2018, Morocco ranks number 3 in Africa after Mauritius and Rwanda. In North Africa Morocco has the highest ranking. Globally the country stands at rank number 69 out of 190 countries. In 2010 Morocco only ranked number 128 globally.

At the same time companies operating in the Kingdom are facing many obstacles. Competitors' practices in the **informal sector** appeared as the main constraint to doing business in Morocco. These companies are offering their products below cost price as they pay no taxes and social security, providing employment without labour contracts, and paying employees below official minimum wage. The share of firms that reported competing against firms in the informal sector was 47.3%. The informal sector in Morocco is large, accounting for an estimated 40% of the official estimated GDP. Those living in rural areas, especially young people and women, face difficulties finding jobs in the formal sector and are therefore relegated to working in the informal sector. Also, some small businesses prefer to operate in the informal sector in order to avoid complicated bureaucratic procedures and payment of taxes.

Corruption was the second most severe obstacle facing firms economically active in Morocco. As in other Mediterranean countries, personal contacts and informal gifts or payments are often used to facilitate or speed up administrative or customs procedures. Of firms surveyed by the World Bank, 18.2% reported that an informal gift or payment was expected or requested to obtain an import

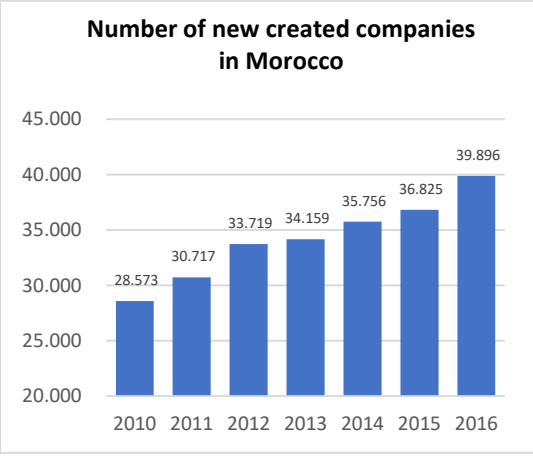
licence – the highest in the Mediterranean region. In addition, 7.5% of firms reported that an informal payment or gift was expected or requested by tax officials – above the Mediterranean average of 6.2%. When it comes to the court system, 65.3% of firms surveyed tended to disagree or strongly disagree that the court system was fair, impartial and uncorrupted.

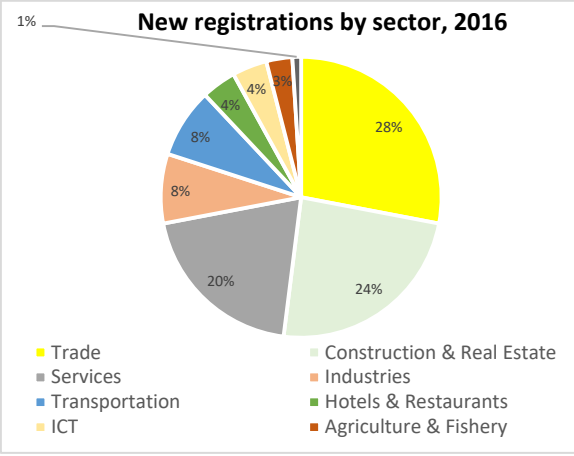
Workforce skills were the third major constraint. Tertiary education does not provide the young with the necessary skills that are demanded by the private sector. Although the Moroccan government has managed to increase the number of children enrolled in primary and secondary schools, the quality of this education lags behind. According to the African Development Bank, there is also a skills mismatch in the form of an oversupply of university students majoring in social sciences, education and humanities (around 75% of Moroccan students). Only around 18% of students pursue scientific, technical and engineering subjects at university – the fields that offer most of the jobs in the private sector.

2.5.2 Starting a business

According to the Moroccan Office of Industrial and Commercial Property (OMPIC), the number of newly created companies in Morocco has been increasing during the last couple of years. In 2010 the total number of newly registered companies was around 29,000, which rose to almost 40,000 in 2016. An increase of 40% in only six years. The regional breakdown of new registrations in the Trade Register in 2016 shows that the majority set up a new business in Casablanca - Settat, with a share of 37% in total newly created companies in 2016. This number 1 position has been constant over the years. Secondly is the region of Rabat-Salé-Kenitra (15%). Looking at the legal form of the newly created companies in 2016, almost 50% are Single Member Limited Liability Companies (one-person companies or SARLAU) and about 48% are Limited Liability Companies (SARL).

New registrations of companies by sector breakdown reveals that there are three sectors which together count for two-third of all new registrations in Morocco in 2016. These sectors are Trade, Construction & Real Estate and Services (excluding Financial services). The sector Transportations only had a share of 8%. In 2010 the sectors Trade, Construction & Real Estate and Services were also the Top 3 ranking sectors for new registrations.





Source: OMPIC *Source: OMPIC*

Figure 7: Private Sector in Morocco

How to create an enterprise in Morocco?

The main stages for creating a commercial enterprise of **natural entity** type are as follows:

Stage 1: Negative certificate

It is a document which proves that the trading name (for legal persons), acronym or trading name (for individual businesses) requested is not already used and can be registered for the registration in the trade register. This is the first document needed to create an enterprise.

Stage 2: drafting of the statutes of company

The status is a set of contractual, and legal provisions that define the impersonal and objective rules applicable to a determined legal situation. The status can be a notarial deed; written by a notary at the customer's request or private agreement concluded by the parties or by third parties (trustee or counsel...).

Stage 3: Establishment of the subscription form

The subscription form is a document that must be filled by the person who wishes to participate in the capital formation of the enterprise. This form includes a promise of contribution in cash.

Stage 4: Establishment of the statement of subscription and payment

The statement of subscription and payment is a document drawn up and signed by the president in which he states the amount of payments made by shareholders.

Stage 5: Blocking of funds

Blocking of capital is made at the bank that provides the customer with a bank certificate proving that he has the necessary and mandatory funds required by law.

- For the SARL : suppression of formality of blockage for companies of which the capital does not exceed 100,000 dirhams
- The amount differs depending on the legal form of the chosen-enterprise.

Stage 6: The registration of legal acts

The formality of registration has the effect of acquiring certain date to private conventions and ensure the conservation of acts, it gives rise to the collection of a tax called "registration fee".

- 1% of the capital with a minimum of 1,000 dirhams.

Stage 7: Subscription to business tax and tax identification

This is the registration of the company with the tax administration. This stage of the creation allows the enterprise to choose its tax regime and particularly obtain its identifier to the business tax.

Stage 8: The registration in the trade Register

The registration in the commercial register means the birth of the enterprise. The registration in the commercial register must be made within three months after the creation of the company. The registration of a company can be required by the managers or members of the administrative, executive or management or by agents provided with the powers.

Formalities after the creation

Publication: After the registration in the trade register and in a period not exceeding one month, two advertisements are mandatory in the journal of legal notices and the Official Gazette.

Membership to the CNSS: Membership of the CNSS (Morocco's social security system) is a legal obligation. Any enterprise subject to the social security must be member of the CNSS, issuing it therefore a membership number which is an official recognition of its identification, its registration and attachment to the regime.

For the creation of a natural person enterprise (individual) the following stages have to be taken:

Stage 1: Negative certificate (optional)

The trader can opt for the choice of a trading name (for individual business) that affix to his business and that will allow him to make known his business to the public. In this case, the trader must request a negative certificate attesting that this trading name (for individual business) is not already used and can be operated for the registration in the trader Register.

Stage 2: Subscription to the business tax

it is the registration of the company with the tax administration. This stage of creation allows the enterprise to obtain its identifier to the business tax.

Stage 3: The registration in the Commercial Register

Trader must file a written application to the secretariat of the clerk's tribunal on which depends the principal establishment or commercial enterprise. The registration in the trade Register must be made within three months after the opening of the commercial establishment or the acquisition of goodwill.

3. Institutional Context

3.1 Governance Structure and Sector Policies & Regulations

An important part of understanding the renewable energy framework in Morocco is to understand the underlying governance structure giving legitimacy to the sector, its institutions and the type of approach to be undertaken by foreign investors interested in entering the market. Since 2008/2009, which can be regarded as the starting point for Morocco's energy transition, significant milestones have been achieved in this transition:

2009

- Presentation of the national energy strategy
- Enactment of the framework acts containing provisions on the liberalisation of the electricity market, renewable energy and energy efficiency: act 13-09, act 47-09 and act 16-08
- Presentation of the Moroccan solar power plan

2010

- Presentation of the Moroccan wind power plan
- Creation of the National Renewable Energy and Energy Efficiency Development Agency – ADEREE
- Creation of the Moroccan Agency for Solar Energy – MASEN
- Creation of the public energy investment company Société d'Investissements Énergétiques – SIE

2011

- Creation of the Research Institute for Solar Energy and New Energies – IRESEN (Institut de Recherche en Energie Solaire et Energies Nouvelles)

2015

- Commissioning of the first concentrated solar power (CSP) plant NOORo I (160 MW) in Ouarzazate under the Moroccan solar power plan
- Work started on three centres providing training in renewable energy and energy efficiency (IFMEREE) in Oujda, Tangier and Ouarzazate – the first of their kind in North Africa
- Publication of act 58-15 to open up access to low- and medium-voltage networks, amending and supplementing act 13-09, and of decree no. 2-15-772 concerning access to the national medium-voltage electricity network

2016

- Adoption of act 48-15 regulating the energy sector and establishing the National Electricity Regulatory Authority – ANRE
- Restructuring of the government institutions MASEN, ONEE and ADEREE/AMEE by acts 37-16, 38-16 and 39-16, renaming them, modifying their powers and duties

Figure 8: Sector governance structure policies and regulation

The Moroccan energy authorities were restructured in the summer of 2016: MASEN, until then responsible for implementing the Moroccan solar power plan, had its mandate extended to include all renewable energy sources and became the Moroccan Agency for Sustainable Energy. ADEREE was renamed AMEE (Moroccan Energy Efficiency Agency) and now focuses on matters relating to energy efficiency. Below is a list of recent legislative developments concerning the Moroccan energy sector.

Act 16-08 on self-generation provides, for the first time, for the generation of electricity by any individual or legal entity for their own needs. Self-generation is subject to prior authorisation and the following conditions:

- Capacity must not exceed 50 MW;
- The electricity generated may only be used by the producer; and
- Any surplus electricity must be sold directly to ONEE.

At present, it is mainly the big cement companies – Lafarge (30 MW) and Ciments du Maroc (5 MW) – and the publicly-owned phosphate company OCP that are taking advantage of this option.

Act 13-09 provides that any individual or legal entity may produce electricity from renewable energy sources. The electricity generated can either be used to meet the producer's own power requirements or fed into the medium- or high-voltage grid and sold to users with a suitable type of connection. This is extended to the low-voltage network by **act 58-15**, although the implementing decree is still being prepared, so some dutch companies still have time to catch up in the developing low-voltage market. This means that decentralised feed-in on a large scale by private individuals and small enterprises is not yet possible. This obstacle will be removed in the medium term, which should give a considerable boost to electricity generation by small photovoltaic installations. Wind power plants with a capacity of 2 MW or more can only be constructed on sites specifically designated for this purpose. Electricity generation installations with a capacity of 2 MW or more and thermal power installations of 8 MW or more are also subject to a licensing regime. This act authorises the exportation to the electricity grid of a part of the electricity produced. In all cases, ONEE is in charge of distribution and transmission, and must also be involved in any sale of electricity. Under this act's provisions, these enterprises have installed the following electricity generation capacities:

- Nareva (200 MW) (Nareva is an SNI company focused on Energy)
- UPC Renewables (120 MW) (UPC Renewables Asia I Ltd is a client of a Dutch bank, FMO)
- Innovent Maroc (18 MW) (French project development company)
- Energies J2 Terre (17 MW) (Moroccan company active in developing Micro-Hydraulic power plants)
- Platinum Power (36 MW) (Moroccan project development company)
- SGTM (22 MW) (Moroccan construction company)

Act 47-09 concerns energy efficiency in buildings (residential and commercial), transport and industry. It introduces energy performance ratings for buildings, equipment and appliances, compulsory energy audits for facilities exceeding a certain consumption threshold in industry and the service sector, prior energy impact assessments for urban development and construction programmes when anticipated consumption exceeds a certain threshold, and technical energy efficiency measures.

The act also encourages energy efficiency training and awareness-raising activities. Implementing decree no. 2-13-874, which for the first time lays down minimum technical specifications in terms of thermal performance (roofs, exterior walls, windows, floors, etc.) for new constructions, came into force in November 2015.

These laws, along with a number of other provisions, are the crucial first steps in the liberalisation process. All the experts consulted agree, however, that further liberalisation is required, particularly in terms of increased access to the low-voltage network, for the Moroccan market to become more attractive, especially to small- and medium-sized enterprises (particularly those in the photovoltaic (PV) segment), which are largely excluded from large-scale projects.

The publication of act 48-15 in July 2016 was an important step in the liberalisation of the energy sector. It creates a **national regulatory authority (ANRE)** responsible for establishing the tariffs and charges that new producers must pay to access and use the medium- and high-voltage networks. The legislation is now being implemented and will enable the authority to manage any conflicts that may arise between operators and network users. ONEE's high-voltage network will be managed separately from energy generation to ensure equitable access for new producers. Although act 58-15 provides for the opening up of the low-voltage network to decentralised producers, the implementing decree is still being prepared and, at the time of writing this brochure, no application date had been fixed for these provisions.

3.2 Forms of investment / financing

Investment in the construction of power plants generally occurs through public-private partnerships, which always involve one of the government energy agencies (usually ONEE or MASEN). Investments can, however, be wholly public (usually through the ONEE) or wholly private. The possibility of private investment was provided for in act 13-09. In Morocco, funding for such projects comes from the ordinary government budget, the Hassan II Fund for Economic and Social Development, the Energy Efficiency Fund (FEE), the Energy Development Fund, SIE's Renewable Energy Fund (FER) and ONEE's own funds. Morocco receives financial support from a number of institutions and countries, such as: KfW, AFD, Arab states of the Arabian Gulf and others.

The diagram below shows a typical scheme for role distribution for a renewable energy project in Morocco.

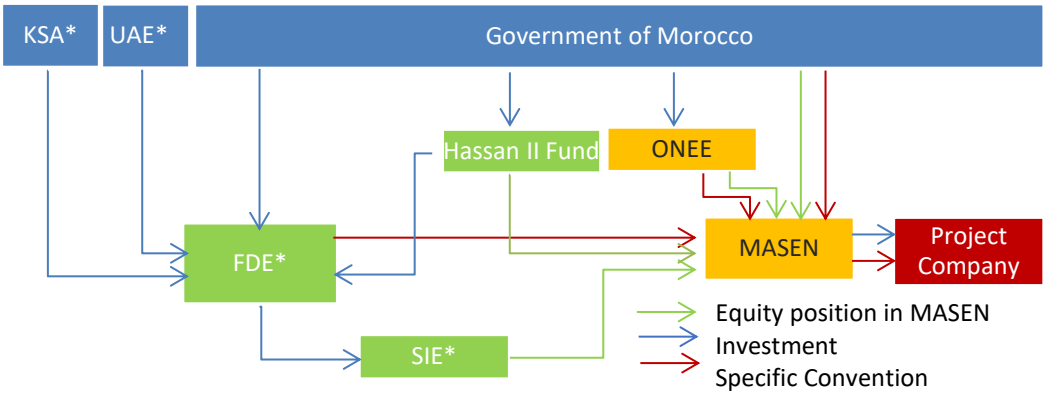


Figure 9: Structure of partnership for international project in Morocco
Source: Lan Nguyen, SOLAR ENERGY – HARNESS THE POWER OF THE SUN PLANTS IN MOROCCO AND TURKEY, Temple University, March 28th, 2015

- KSA: Kingdom of Saudi Arabia
- UAE: United Arab Emirates
- FDE: Energy Development Fund
- SIE: Energy Investment Company

3.3 Public Sector Partners

Table 4: Moroccan energy sector – ministries

Ministry	Brief description	Information and assistance	Further information/ Contact
MEMDD Ministry of Energy, Mining and Sustainable Development	As the ministry concerned with the energy sector, the MEMDD establishes the legal framework for the sector, ensures the practical implementation of the national strategy and oversees a number of subordinate departments and agencies.	> Information on the general (legal) framework for the energy sector > Information on the strategic directions established for the country's energy and environment sectors > Official statements and announcements	www.mem.gov.ma (In French)
MEF Ministry of Economy and Finance	The MEF regularly publishes the latest figures and indicators for the economic and budgetary situation in Morocco containing important data for the energy sector. It is also the contact point for fiscal and customs matters, and responsible for	> Information on national economic and budgetary indicators > Information on the legal framework for fiscal and customs matters	www.finances.gov.ma (In French)

Ministry	Brief description	Information and assistance	Further information/ Contact
	the Hassan II Fund for Economic and Social Development.		
MIICEN Ministry of Industry, Investment, Trade and the Digital Economy	MIICEN and its subordinate departments are responsible for implementing two ambitious programmes, the industrial promotion plan and the industrial acceleration plan, and for creating industrial parks.	> Information on the industrial sector and national industrial strategies	www.mcinet.gov.ma (In French)
MAPMDREF Ministry of Agriculture, Fisheries, Rural Development, Water and Forests	The MAPMDREF is responsible for setting and implementing national strategies for the agricultural sector (primarily the Green Morocco Plan). It is, therefore, the contact point for energy solutions in agriculture.	> Information on the agricultural sector and national agricultural strategies	www.agriculture.gov.ma (In French)

Table 5: Moroccan energy sector – agencies, institutes and associations

Organisation	Brief description	Information and assistance	Further information/ Contact
ONEE National Office for Electricity and Water	ONEE is the main actor in the Moroccan electricity market. It owns the network, produces electricity, buys electricity from Moroccan private producers, imports electricity and is responsible for electricity distribution (which it carries out itself and through private and public sector companies).	> Current market and consumption statistics > Information on ongoing tenders (particularly for power plant construction and network development) > Information and licensing for electrical grid feed-in > Licensing for generation facilities subject to authorisation	www.one.org.ma (In French)
MASEN Moroccan Agency for Sustainable	MASEN develops projects at the technical, economic and financial level and coordinates activities in	> Information on the Moroccan solar power plan and its state of progress	www.masen.ma

Organisation	Brief description	Information and assistance	Further information/ Contact
Energy	the renewable energy sector. It was previously tasked solely with implementing the national solar power plan, but its remit has now been extended to include the implementation of objectives for all renewable energy technologies.	and implementation > Information on ongoing tenders (particularly for the construction of power plants) > Matching and connecting with contacts	
AMEE Moroccan Agency for Energy Efficiency	ADEREE, founded in 2010, was renamed AMEE in 2016 as part of an extensive institutional restructuring. It is now responsible for all projects in the energy efficiency sector, including the implementation of the national solar energy efficiency strategy and the updating of wind and solar mapping.	> Information on current and anticipated regulations and strategies in the field of energy efficiency > Information on sites identified as suitable for the location of wind or solar power plants > Matching and connecting with contacts	www.amee.ma
IRESEN Institut de Recherche en Énergie Solaire et Énergies Nouvelles	Set up in 2011, IRESEN is tasked with identifying research subjects and projects in the field of renewable energy and energy efficiency. In addition to financing and implementing research and development projects, it also disseminates research findings and promotes their effective use by businesses.	> Additional information on the renewable energy and energy efficiency sector > Tenders for small generation units up to 50 kW (PV in particular) > Matching and connecting with contacts	www.iresen.org (In French)
ADA Agricultural Development Agency	Created in 2009, ADA is responsible for preparing and implementing important components of the strategy established for the agricultural sector	> Additional information on the agricultural sector > Information on investment opportunities,	ada.gov.ma (In French)

Organisation	Brief description	Information and assistance	Further information/ Contact
	(e.g. irrigation systems, storage and cooling systems, promotion of investment, and partnerships with investors).	matching and connecting with contacts	
AMDI Moroccan Investment Development Agency (Invest in Morocco)	This agency, GTAI's Moroccan counterpart, is the traditional point of contact for foreign investors and provides a range of services. It has offices in Frankfurt, Paris, Rome, Madrid and Rabat.	> Additional information on investment conditions and possibilities for obtaining aid in Morocco > Sector and market overviews > Matching and connecting with contacts	> amdi.frankfurt@invest.gov.ma > amdi.paris@invest.gov.ma > amdi.roma@invest.gov.ma > amdi.madrid@invest.gov.ma > info@invest.gov.ma www.invest.gov.ma (In French)
FENELEC National Electricity, Electronics and Renewable Energy Federation	FENELEC, created in 1997, is a national federation bringing together professionals from the electricity, electronics and renewable energy sectors. It currently represents five associations, including AMISOLE, covering practically the entire sector.	> Additional information on branches of activity and markets > Matching and connecting with contacts	www.fenelec.com (In French)
AMISOLE Moroccan Association of Solar and Wind Power Industries	AMISOLE, created in 1987, carries out lobbying and communication activities, organises trade fairs and exhibitions, finances the creation of clusters, conducts market studies and matches actors with each other. It also runs three renewable energy training centres. AMISOLE has around 70 members.	> Market studies and business intelligence > Matching and connecting with contacts	Résidence Mervet, 4 rue de la Bastille, Casablanca, Maroc Tél. : +212522949182
Cluster Solaire Association of actors operating in	Cluster Solaire represents 260 enterprises. In addition to its traditional association role, it also	> Matching and connecting Moroccan and foreign companies	www.clustersolaire.ma (In French)

Organisation	Brief description	Information and assistance	Further information/ Contact
the solar energy sector	matches Moroccan and foreign companies (mainly Spanish, French and German), with a view to them creating partnerships and joint ventures.	> Small-scale co-financing, particularly for technology demonstrations/ presentations > Information on the Moroccan solar energy sector > Matching and connecting	
Cluster EMC Energy Efficiency of Construction Materials	Cluster EMC, created in 2013 and supported by the Ministry of Industry, brings together enterprises, architects, consulting firms, researchers, universities, foundations, the media and other experts who together promote innovative approaches, solutions and projects in the field of energy efficiency in buildings.	> Guidance and support for members and their projects > Preparation of studies and surveys > Information on standards in the construction sector > Capacity building and training	www.clusteremc.org (In French)

3.3.1 IRESEN

IRESEN is both a funding agency and a research centre. It was established in 2011 by public and private shareholders[7]. As a funding agency, it finances collaborative projects involving companies and research institutions, and organises calls for proposals for applied R&D. In January 2018, IRESEN also started targeting innovation projects to encourage innovation in the renewable energy sector. As a funding agency, its main mission is to support the government's renewable energy strategy through Research & Development. The innovation aspect is to be fully implemented in 2018. IRESEN, as a research center, is developing a network of R&D facilities in collaboration with national universities and national / international research institutions. IRESEN has the first applied research centre in Morocco: Green Energy Park dedicated to solar technologies. The construction of the second R&D platform will be launched in 2018: Green and Smart Energy Park, dedicated to the use of renewable energies in buildings, smart grids (cities and homes) located in the Green City in front of the Green Energy Park. The purpose of this second platform is to serve as a stepping stone for smart villages in Morocco and, thereafter, regions and cities across Morocco. A third R&D platform will be dedicated to the water / energy nexus in order to treat water using renewable energies. A fourth R&D platform will be dedicated to bio-energies and storage. IRESEN's main partner is OCP,

[7] IRESEN's shareholders: Ministry of Energy, Ministry of Finance, Ministry of Education & Vocational Training, ONHYM, OCP, ONEE, MASEN, AMEE, Nareva, Managem

the phosphate company, which is also a founding member of IRESEN and the main (financing) partner for the development of the R&D platforms. IRESEN has:

- more than MAD 200 million dedicated to R&D applied in Morocco;
- 10 calls for proposals yet to be announced in the solar thermal, wind, PV and other RE domains;
- 40 innovative projects in progress in solar, thermal, PV, wind and biomass linked to thermal energy; and
- more than 540 researchers, as well as professors, PhD and other students supported by IRESEN.

OCP is a logical partner for IRESEN as it is the incubator of Mohammed VI Polytechnic University. Through this partnership, IRESEN is capable of immediately implementing solutions after the development process. Another advantage is OCP's mission to be present across Africa, thereby providing IRESEN with the necessary distribution channels. IRESEN follows the same model as the Fraunhofer Society: a leading research organisation for applied research in Europe.

3.3.2 ONEE

ONEE is the National Agency for Electricity and Potable Water. Their most important role, within the renewable energies space, is that of a grid operator owning the transmission grid. They are also able to launch solar projects. Before the transfer of the renewable energies department to MASEN, ONEE launched most of the calls for proposals in wind, solar and hydropower. Due to law 13-09, ONEE will no longer be the only operator. As mentioned earlier, due to the lack of a feed-in tariff, ONEE has introduced a guarantee offering independent power producers of renewable energies to benefit from the transmission of electricity through the grid network at a fixed rate and repurchase by ONEE of any surplus electricity produced. This guarantee has primarily been used in the wind energy sector.

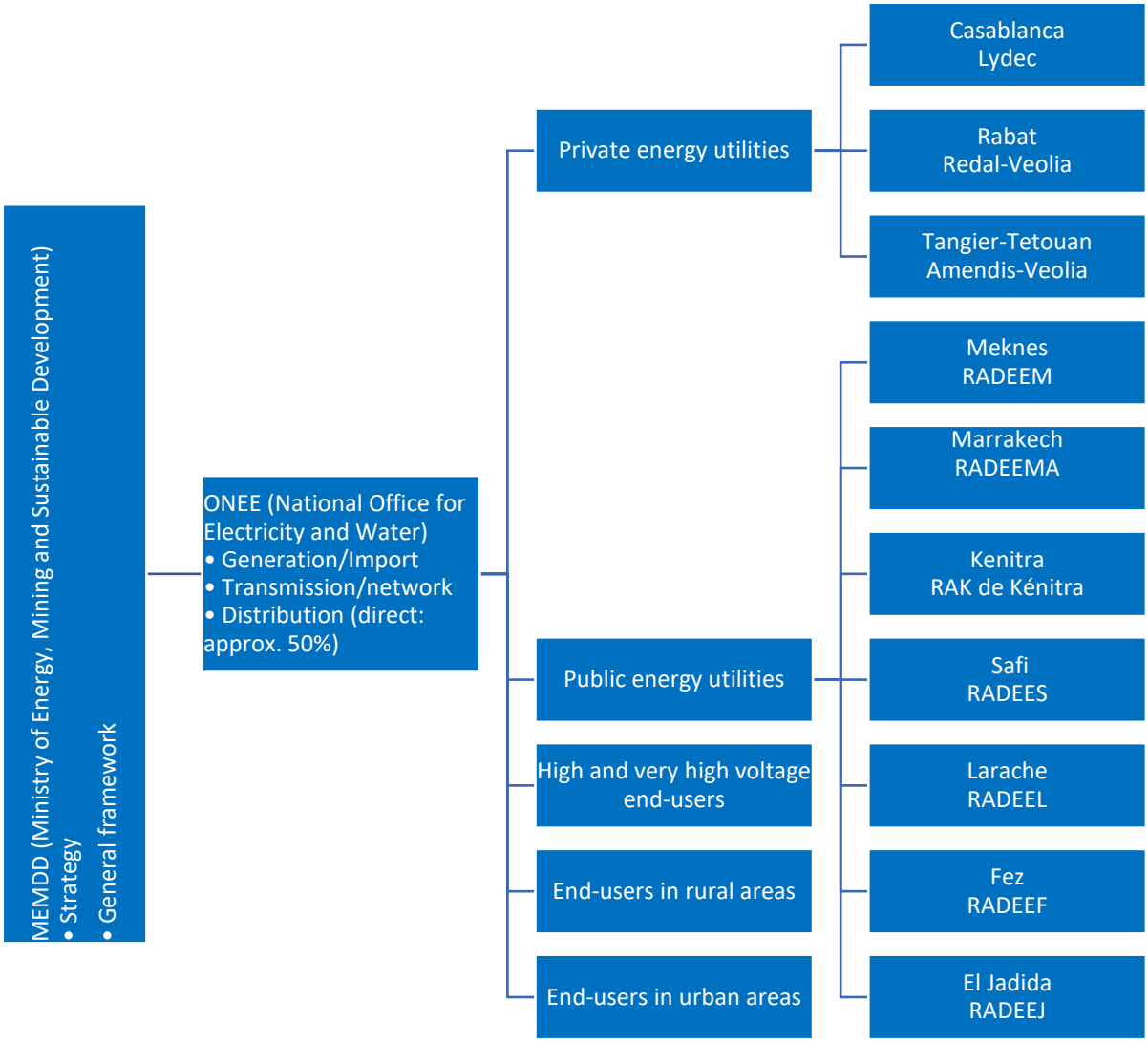


Figure 10: Structure of energy generation and distribution in Morocco

Source: Renewable energy and energy efficiency in Morocco Context and market access Information for small- and medium-sized enterprises, Moroccan-German Energy Partnership PAREMA, Mai 2017

3.2.3 MASEN

Morocco is mostly dependent on imported fossil fuels (primarily oil and coal) covering 95-98% of the total electricity supply, with 3,600 million barrels of crude imports. However, the high number of energy imports in combination with higher international prices is a burden on Morocco's foreign exchange reserves (FER) and threatens the national economy. Morocco needs to reduce import dependency, increase the security of supply and expand the low carbon economy and energy conservation. This has led to the nascence of the Moroccan Agency for Solar Energy, as part of the Morocco Solar Plan, with the main objective of obtaining energy security by means of large investments in the development of solar energy. When the mandate expanded in 2016, the

Moroccan Agency for Solar Energy became the Moroccan Agency for Sustainable Energy. MASEN's stakeholders are: ONEE (25%), Ministry of Finance (25%), SIE (25%) and the Hassan II Fund (25%).

In addition to MASEN's mission to achieve 52% of electrical power generated from renewable energies, it also is mandated with the use of renewable energy for economic growth. In achieving this, they support the ecosystem in the following objectives:

- Industrial Development;
- R&D Development;
- Development of competencies; and
- Development of installations.

MASEN is a sponsor of renewable energy projects that issues calls for proposals to select an IPP (Independent Power Producer) to generate electricity from renewably energy. MASEN eventually sells this to the grid. MASEN prepares the infrastructure, buys the land and equipment, and prepares feasibility studies and technical documents for such calls for proposals. MASEN also provides the technology and the financing, mobilised through funds from international development agencies. After this process, they re-lend the project to the operator.

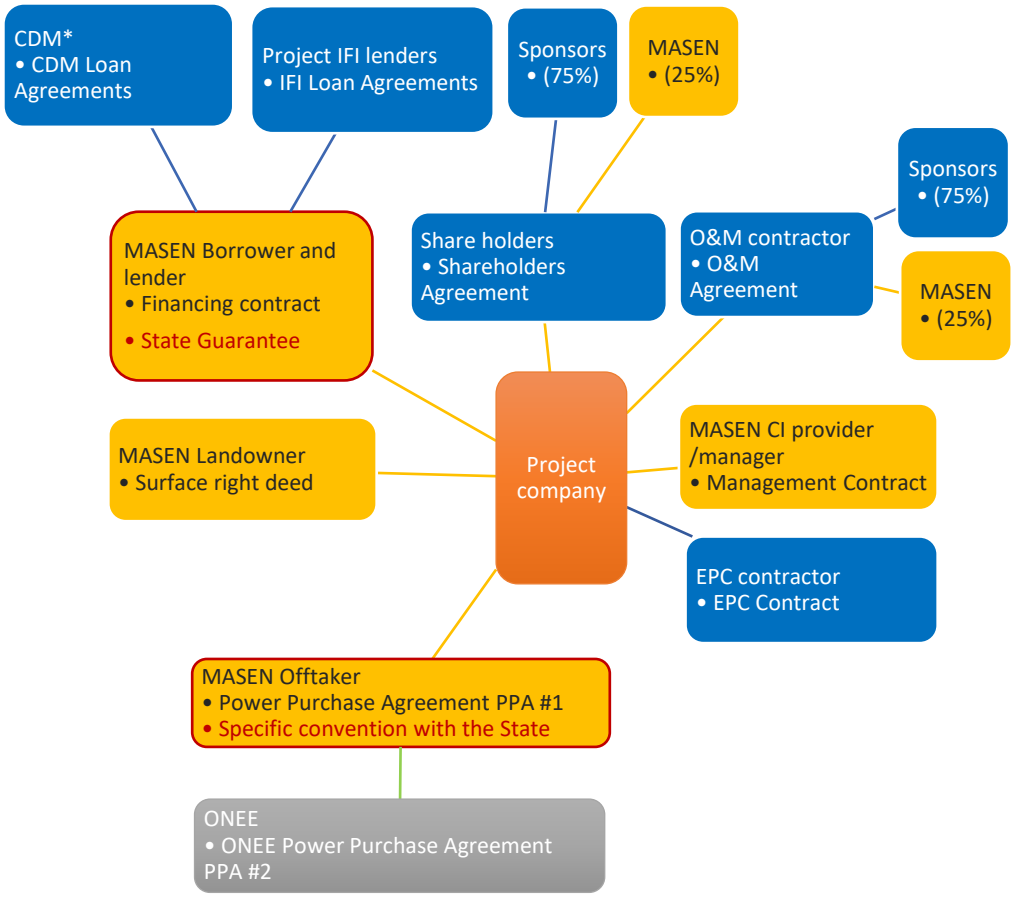


Figure 11: Project development of an international project in renewable energy in Morocco

*Clean Development Mechanism
Source: Ali Zerouali, MASEN, RENEWABLE ENERGY DEVELOPMENT IN MOROCCO, ESEF, October 2017

3.3.4 AMEE

AMEE, previously ADEREE (National Agency for the Development of Renewable Energy and Energy Efficiency), is the National Agency for Energy Efficiency in Morocco. Based on law 47-09, the regulatory framework for energy efficiency, AMEE was created to implement the energy efficiency strategy aimed at an energy efficiency improvement of 20% by 2030 through specific projects in transport, buildings, industry, agriculture and public lighting.

3.3.5 SIE

The SIE is an investment company created in 2010 for developing renewable energy and energy efficiency in Morocco. It is owned by the government (71%) and the Hassan II Fund (29%). As the financial arm, SIE is the funding agency in the renewable energy ecosystem in Morocco. The SIE is not a developer, but as a shareholder of MASEN, it indirectly develops projects. SIE's investments take a minority shareholding interest in companies with viable and profitable projects, then eventually exits the company after project completion.

The SIE develops small-scale medium-voltage projects with PV plants distributed within Morocco. SIE has funded the following projects:

- Moroccan Solar Programme;
- National Integrated Wind Project (NIWP); and
- Private wind projects.

3.3.6 ANRE

Through law 48-15, dated May 2016, the Kingdom of Morocco created the "Agence Nationale de Regulation de l'Electricité" or the "National Agency for the Regulation of Electricity". This agency would regulate authorisation procedures, while supporting the efficiency of the sector and the transport of electricity, but would also support the government in legislation and regulations with regards to renewable energy. Although the law has passed, at the time of writing this report ANRE had not yet been created. This is due to the fact that the process of nominating people to the regulatory agency had not been completed and there was no clarity as to the timing.

3.4 Private Sector Partners

3.4.1 NAREVA

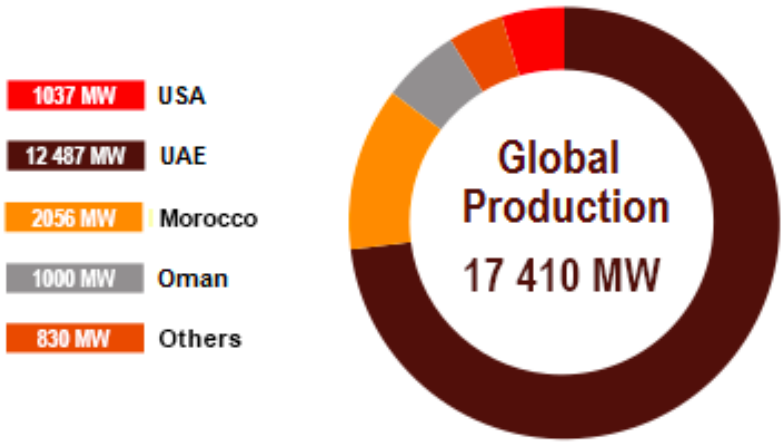
Nareva Holding, created in 2005, is owned by SNI, which is the National Investment Company. Nareva is an independent power producer (solar power). Nareva is also part of the consortium (with Enel and Siemens) awarded the largest wind project in Morocco (consisting of 5 wind farms of 850 MW). In addition Nareva is one of the founding members of IRESEN.

3.4.2 OCP

OCP, the phosphate company of Morocco, is very influential in the economy, especially because Morocco has the second largest phosphates reserves in the world (after the United States). OCP is the largest consumer of electricity in Morocco, with the current 6% usage expected to rise to 10% within a few years due to the company's expansion plans. OCP has built its own power plant (300/400MW) for industrial use. OCP will be expanding to the African continent more prominently in the next few years.

3.4.3 Taqa

Taqa Morocco is the first private independent producer in Morocco: a subsidiary of Taqa Group, a world-wide leader in the production of energy, of which 75% is owned by the Abu Dhabi government. Taqa Morocco currently manages one of the biggest thermal power plants in the country, at Jorf Lasfar.



Source: https://www.taqamorocco.ma/
Figure 12 : Taqa Morocco

The thermal power station fired by coal in Jorf Lasfar is the main supplier to the national electricity grid office ONEE covering more than 50% of the electricity national demand and 30% of the installed capacity. The total capacity of the Jorf Lasfar power plant is 2056 MW. The power plant director is Mr. Vollebregt, of Dutch decent. Taqa Morocco is a successful foreign investment by the United Arab Emirates, which has close collaboration with the Moroccan government.

3.5 Branch Organisations

FENELEC (The National Federation of Electricity, Electronics and Renewable Energies)
FENELEC was formed over 12 years ago and by 2017 had over 386 members, representing over 95% of the service and product requirements for the electricity and electronic sectors. It is further divided into 5 associations i.e. Associations of Electric products manufacturers; Electric products filters; Electric products distributors; Electronic sector; and the Moroccan association of solar and wind energy industries. Its mission is to: represent the interests of its members in all related fields; actively participate in the implementation of electric and electronic sectors; and initiate work to support companies in their transformation to meet Moroccan and international standards. FENELEC

also has partnerships with: ANIE (Italy), AMEC / AMELEC (Spain), CNAM (France), UTE (France), GATG (Germany), GTZ (Germany) and SNESE (France), among others.

CMPP (The Moroccan Centre for Cleaner Production)
CMPP is a centre of excellence which opened in 2000 as a result of a public private partnership between the Ministry of Trade and Industry, the Department of Environment and the General Confederation of Moroccan Enterprises (CGEM). CMPP is a member of the United Nations Development Organisation (UNIDO); United Nations Environmental Programme (UNEP); and the International Resource Efficient and Cleaner Production network (RECAP Net). Its main services are: awareness raising; dissemination of technical information on cleaner production; environmental and energy audits; and training on environmental topics. The main objective is to reduce environmental pollution caused by industry, mainly SMEs, through the adoption of resource-efficient and cleaner production (ERPPP)

CGEM – Renewable Energy Committee
CGEM renewable energy committee: encourages companies to use renewable energies and energy efficiency; informs companies and raises their awareness of climate issues, supporting them to carry out actions in favour of the climate by evaluating and reducing their carbon footprint; encourages companies to adopt renewable energy and energy-efficient technologies, andtechnologies for cleaner production, and supports companies in the green sector; informs companies about existing financing and subsidies, helps to mobilise new financing; works towards the introduction of incentives in the context of a green tax system; lobby relevant ministries in favour of its member companies; represents the private sector at the national and international, public and private levels; and supports the development of projects and actions of the Moroccan Centre for Cleaner Production (CMPP).

4. Main Trends & Developments in the Renewable Energy Sector

4.1 Introduction

As Morocco does not have significant fuel deposits, the country relies heavily on imported petrol (in 2014 Morocco imported 89.4% of all its energy used). In addition, total primary energy consumption has increased at a rate of around 5% per year since 2002 and reached 18.8 MTOE (Million Tonnes of Oil Equivalent) in 2014 according to the OECD/IEA. Approximately a third of the total amount of primary energy consumed is used for electricity generation to satisfy an increasing demand for electricity (with an annual growth rate of 5.13% on average between 2007 and 2016). The annual demand for electricity in 2016 was 35,415 GWh. Morocco produced about 30,000 GWh itself and imported the rest from Spain and Algeria via different interconnections (figure 1 below shows the steady growth in demand between 2007 and 2017).

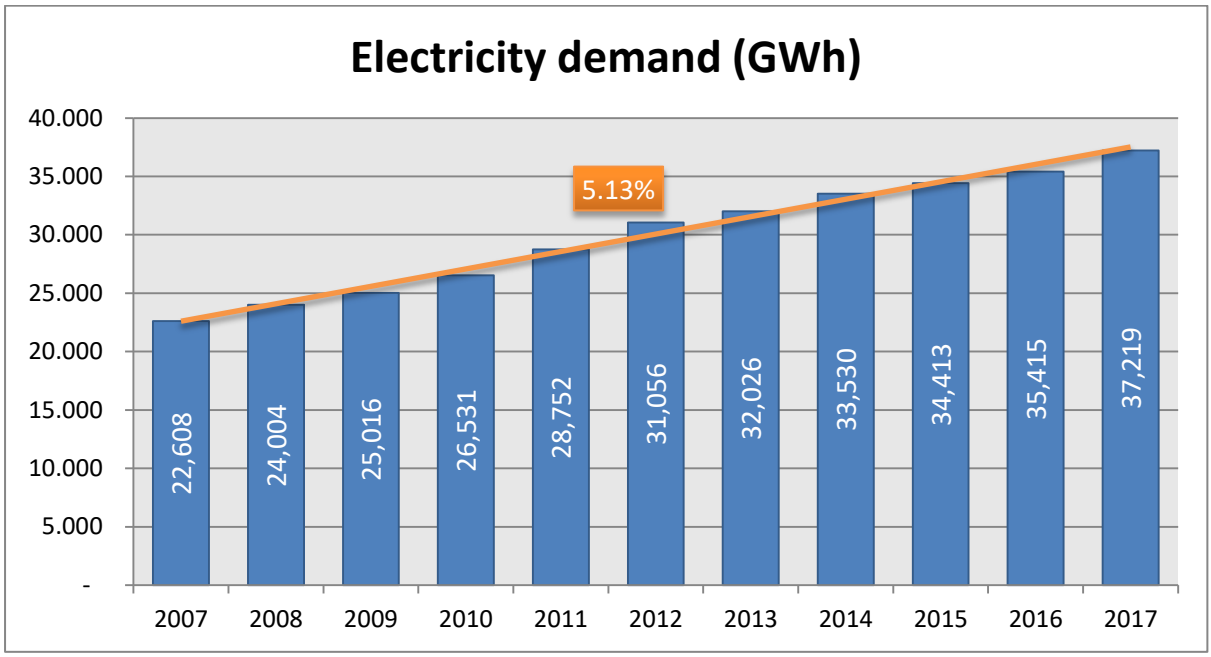


Figure 13: Electricity demand in Morocco (GWh)

The increase in energy demand could be explained by two factors: the growth in domestic demand (Morocco has a population of 34.5 million, with an annual growth rate of 1.25% according to the 2014 census); and an increase in economic activity facilitated by a number of the government's strategic sectorial plans (These strategic plans are part of a process to speed the development of strategic sectors like agriculture, fishery, mining, renewable energy, logistics and promising sectors such as automotive, aerospace and services with high added value). Table 1 below shows Morocco's electricity generation and distribution stakeholder matrix.

Table 6: Structure of electricity generation and distribution in Morocco

ONEE Own Generation Capacity: 4,242 MW Production: 13,460 GWh (42%)	IPP Generation** Capacity: 2,175 MW Production: 12,738 GWh (40%)	Interconnections / Imports: 5,551 GWh (17.4%)	Auto-production* Production: 251 GWh (less than 1%)
ONEE Single Buyer Total demand 32 TWh			
ONEE (Direct supplier) (58%)		Public and Private utilities (42%)	
Distribution MV & LV 11,846 GWh (43%)	EHV-HV Direct clients 4,212 GWh (15%)	Distribution MV & LV 11,739 GWh (42%)	

* Law 16-08 amended and completed with Law 54-14

** Law 13-09 amended and completed with Law 58-15

Source: ONEE-Electricity Branch, Activity report 2012, 2013

4.2 Moroccan National Energy Plan

The National Energy Plan is a roadmap that adresses Morocco's short-, medium- and long-term objectives for developing the energy sector. It focuses on Renewable Energy and energy efficiency as key factors for the achievement of the country's commitment to reducing greenhouse gas emissions. Under this plan, Morocco will raise an estimated USD 18.95 billion (FS8, sectorial plans and strategies, Invest in Morocco, Updated: 03/06/2013) to produce 42% of the total installed capacity in Morocco from renewable energy (solar, wind, and hydro) by 2020. In his statement during the COP21 in Paris, his Majesty the King of Morocco confirmed Morocco's commitment to producing 42% in 2020 and 52% by 2030 of the energy required from renewable energy. Figure 14 shows a scenario of the energy share to fulfill the 52% objective.

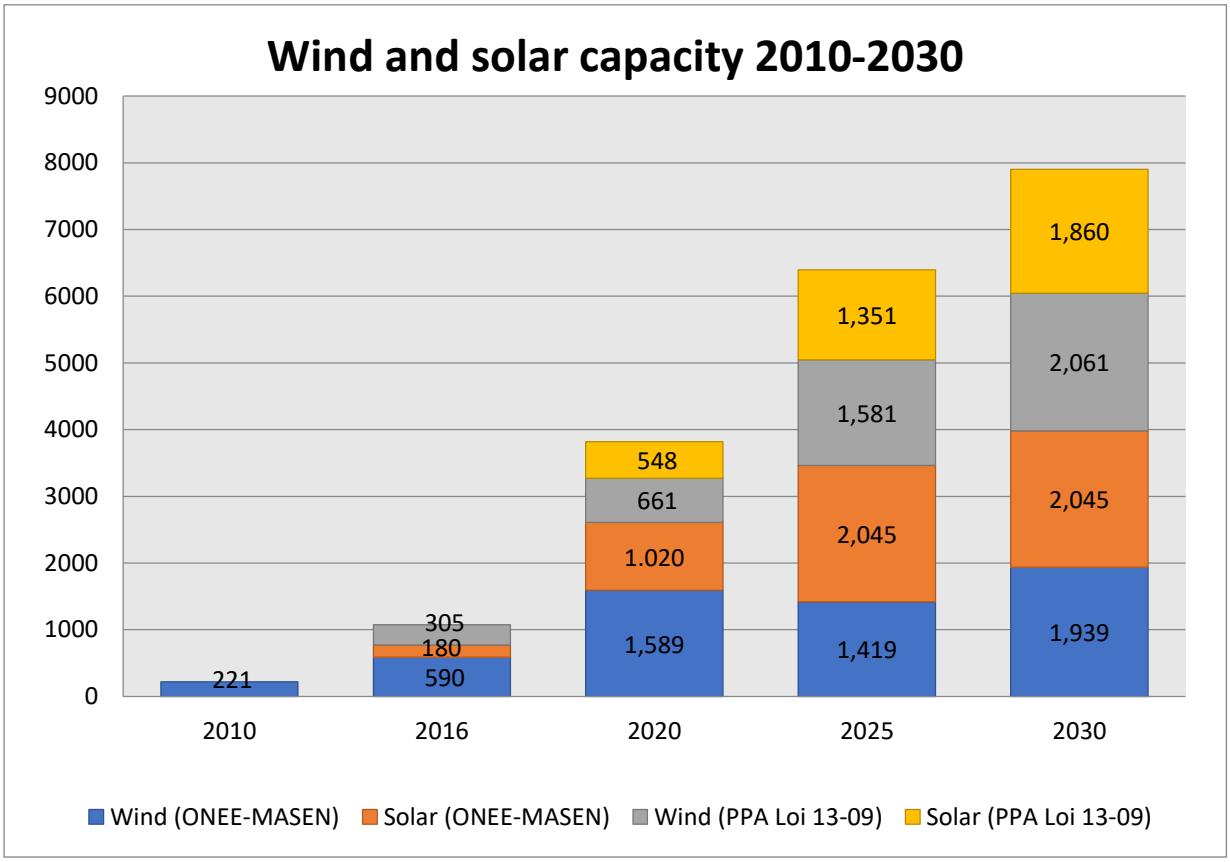


Figure 14: Moroccan wind and solar projects pipeline
Source: Brahim OUMOUNAH, ONEE, Moyens techniques et économiques pour réussir la TE, JMAE Conference, 28.09.2017

In 2015, Morocco's electricity generation capacity was 8,154 MW, with the following mix: coal (31%), fuel oil and diesel (10%), hydropower (22%), gas (25.8%) and wind power (9.4%). A further 6,500 MW will be added by 2020, bringing the total electricity generation capacity up to 14,500 MW. Solar and wind power will both account for around 2,000 MW of this increased capacity. State subsidies granted to the energy sector weigh heavily on the government budget (6% in 2013), which is currently showing a deficit, and result in high financial risk for the government, due to fluctuating energy prices on world markets. These subsidies will be gradually phased out. The electricity tariff system determines a pricing structure that varies according to the level of consumption, time of day and type of meter. In 2015, the end-user price per kWh was between 5 and 17 euro cents (including 14% VAT), with most rates falling within the 6 to 12 euro cent range (including 14% VAT).

To achieve the objectives of the National Energy Plan of 52% of the installed capacity of renewables by 2030, Morocco is implementing new legislation and had been creating project development and financial institutions to enable international projects. Indeed, projects in the pipeline from 2016 to 2030 account for 4,560 MW from solar energy, 4,200 MW from wind energy and 1,330 MW from hydroelectric projects. Under this vision the country wants to reduce its energy dependency on non-reneweable sources to less than 82% by 2030. The government needs more than USD 40 billion to fund this programme, of which 75% is earmarked for renewable energy and energy efficiency only - please see figure 15 below.

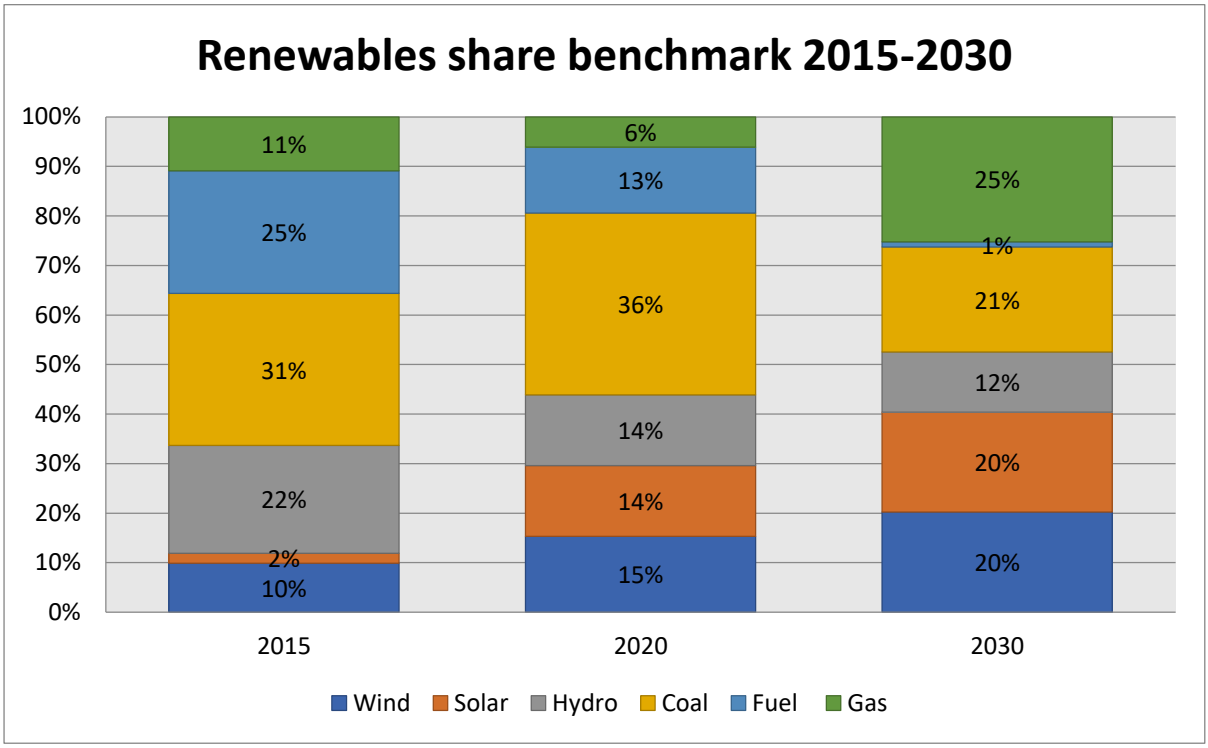


Figure 15 : Renewables share benchmark 2015-2030
Source: Karim Choukri, Energy Ministry, Journée d'Etude: Energies Renouvelables : Défis et Opportunités, Ecole des Mines de Rabat, 26 May 2016

The energy mix foreseen in the national energy plan will be in the diverse technological choices displayed in figure 3 above, with the diversified offer allowing access to more socio-professional categories. In the scenario in figure 15, gas (LNG) will play a big role in energy production after 2020. The objective is for it to compensate for fluctuations in renewable energy, as the penetration rate of the latter will increase. The development programme of LNG is another strategic plan currently being implemented within the national energy plan. Through its energy strategy Morocco aims to consolidate its position in the Region as an operator of reference in renewable energy development.

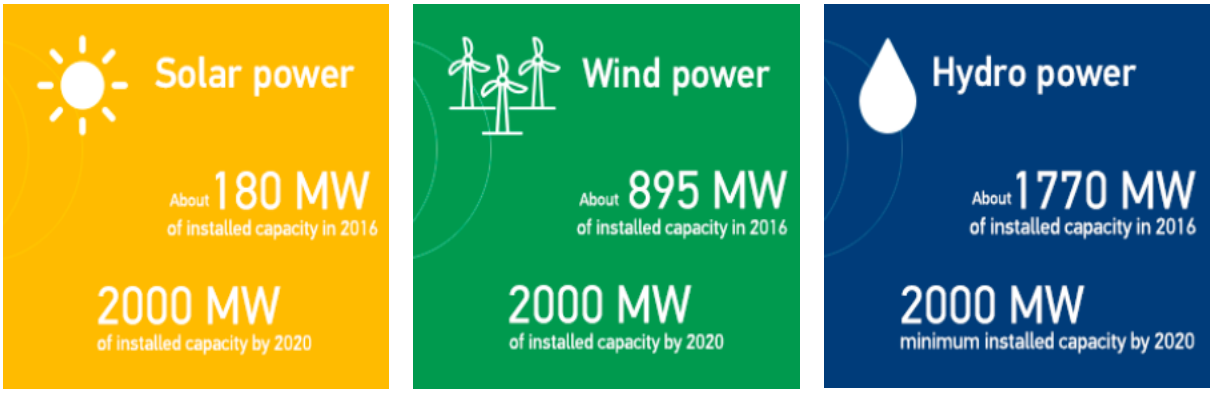


Figure 16: Moroccan Government's aspirations for growth in renewable energy

One of the biggest wind farms on the African continent (Tarfaya win park) was opened in 2014 in south west Morocco, with more to follow in the coming years. Substantial public investments have also been made in solar power, with a project, one of the world's largest solar plants (Noor Ouarzazate) estimated at USD 9 billion that would be fully functional by 2020. In November 2016, the COP 22[8] was hosted by Morocco to push forward the global climate agenda and globally agree on concrete measures.

4.3 Morocco in the regional context (Africa, EU)

4.3.1 Africa

Morocco's economic position offers an opening to the West and East Africa markets, where Morocco has been operating and is invested in heavily. At the COP 21 summit held in Paris, His Majesty King of Morocco hailed Africa as the 'continent of the future'. In 2016, Morocco welcomed COP 22 in Marrakesh, the "COP of Africa". The country promotes South – South cooperation as a long-term target, seeking to establish equitable economic relations with other African countries, particularly in West Africa and sub-Saharan Africa. In order to achieve this visionary goal, various projects will be launched in the years to come to strengthen the role of Morocco as an engine of economic growth in the African continent.

Morocco with its deep historical relationship with West-African countries is enforcing its economic ties, especially in terms of doing business with these countries. Morocco has significantly strengthened its political ties since 2013 and, above all, its economic relations with numerous African countries, including Senegal, Mali, Côte d'Ivoire, Gabon, Guinea and Mauritania.

In recent years some Moroccan sectors, such as banking and services, have built up robust capacities at home and many Moroccan enterprises are now well-positioned in African markets. Some Moroccan banks, such a s Attijariwafa Bank and BMCE Bank, are already operating in various African countries, as is Maroc Telecom, which had 51 million customers in sub-Saharan Africa in 2015.

The Office Chérifien des Phosphates (OCP), a publicly-owned company that produces phosphates and fertilisers, is also well established in various African markets. The ONEE is also active in a number of African countries. As we can see, a whole range of Moroccan enterprises across a variety of sectors are now operating in North Africa and sub-Saharan Africa.

For many years now, the state-owned airline Royal Air Maroc has offered direct flights to Africa's main economic centres at affordable prices. It is one of Africa's top airlines, flying to 32 destinations in 26 countries throughout the continent. As such, it is an asset that should not be underestimated.

Morocco's national trade fairs and exhibitions have long had a regional scope and increasingly focus on African markets. Between 2003 and 2013 Morocco's exports to African countries increased fivefold, rising from approximately EUR 200 million to approximately EUR one billion.

[8] The United Nations Framework Convention on Climate Change (UNFCCC) entered into force in 1994, aimed at reducing greenhouse fas concentrations in the atmosphere. The Conference of Parties (COP) was designated as the supreme governing body of the convention. COP 22 refers to the 22nd Conference of the Parties which was held in 2016 on November 14 and 15 in Marakech, Morocco.

A survey financed by GIZ local experts confirmed the view that Moroccan institutions and businesses have the capacity to develop a lasting presence in different markets in West and East Africa over the next few years. They should focus, to begin with, on French-speaking countries in West Africa.

Table 7: Important expositions in Morocco

Name	Brief description	Further information/contact
Solaire Expo	Solar energy and energy efficiency trade show	solaireexpomaroc.com (in French)
POLLUTEC	Environmental equipment, technology and services trade show	www.pollutec-maroc.com (in French)
Photovoltaicafrica	Photovoltaic trade show	www.photovoltaica.ma (in French)
SIAM	Agricultural trade show	www.salon-agriculture.ma (in French)

4.3.2 European Union

Thanks to its geographic location, Morocco has for centuries maintained very close economic and cultural ties with Europe. The economic side of the relationship in particular has developed significantly since the country began industrialising in the 1970s. Morocco is, therefore, an integral part of the value chains of European enterprises (particularly in outsourcing and subcontracting).

The agricultural sector is one of the traditional pillars of the Moroccan economy, although industry (chemical, pharmaceutical, automotive, food, electronics, aeronautical, textile and leather industries) and services have developed significantly, particularly in the 1990s and 2000s (industry's share in GDP in 2014: 14%). Morocco is pursuing a strategy of transformation, modernisation and diversification. It is endeavoring to diversify beyond simple industries, such as textile and leather, and develop more advanced industries, such as the pharmaceutical, aeronautical and automotive industries. This strategy will enable it to remain in the medium term an important commercial partner of the European Union (EU). In addition, a free trade agreement between the EU and Morocco came into force in 2012, and negotiations are already underway to extend it. Morocco also has an advanced status partnership with the European Union (Making a Success of Advanced Status programme), as part of the European Neighbourhood Policy, giving Morocco access to the EU internal market.

Energy is another sector in which Morocco is an increasingly important partner for Europe. Almost entirely dependent on imported fossil fuels in the past, Morocco is now poised to become a major energy producer. While lacking in any significant fossil fuel deposits, the country's geographical conditions mean that it has enormous potential in terms of wind and solar power.
With the launch of the industrial initiative Desertec[9], the energy companies of Europe and of Germany, in particular, also became aware of this potential. Morocco is now positioned as a strategic EU partner for electricity production and, in the long term, for energy exports to Europe.

[9] DESERTEC is a global renewable energy solution based on harnessing sustainable power from the sites where renewable sources of energy are at their most abundant. These sites can be used thanks to low-loss High-Voltage Direct Current transmission. To help accelerate the implementation of the DESERTEC idea in EU-MENA, the non-profit DESERTEC Foundation and a group of 12 European companies led by Munich Re founded an industrial initiative called Dii GmbH in Munich on October 30 2009

Increasingly, Europeans regard Morocco as an important partner, as evidenced by the bilateral energy partnership with Germany. There is already a physical link between Europe and Morocco: Morocco imports electricity (approximately 5,500 GWh in 2014) from Spain by means of two submerged power cables, with a transmission capacity of 1,400 MW, laid in 1997 and 2006 in the Strait of Gibraltar between Morocco and mainland Spain. They are currently the only transmission cables linking North Africa and Europe. With a view to increasing power links with its neighbors, interconnections with Portugal and Mauritania, and a second interconnection with Spain, are currently being studied.

4.4 Energy sector in the Rif region

The Rif region may be **divided** into three parts: western Rif with its biggest city Tangier, Central Rif with Hoceima as its biggest city and eastern Rif with Nador as its biggest city. In fact, in the new territorial **structure,** Hoceima and Tangier are in the Tangier-Tetuan-Hoceima region and Nador is attached to Eastern region (Oriental).

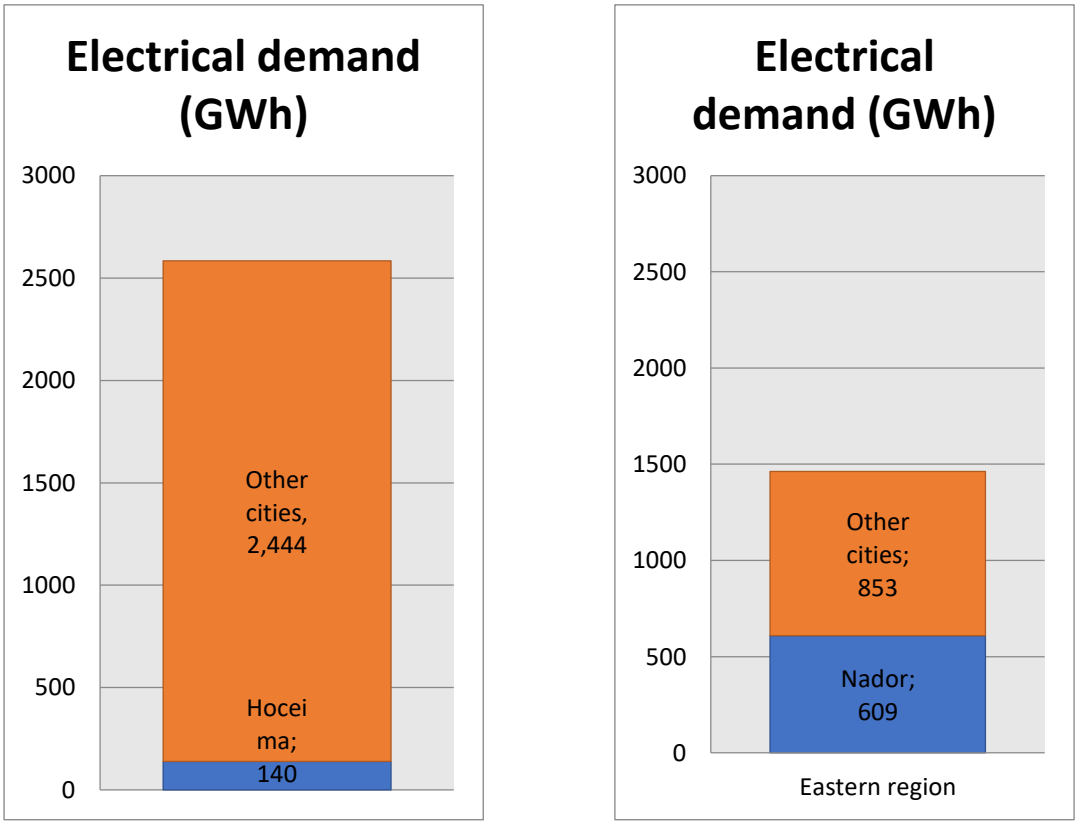


Figure 17: Electrical demand in Hoceima and Nador

Source: Mongraphie Hoceima HCP, 2017 et Monographie Oriental, Minestère de l'Interieur, 2015

The western Rif is characterised by strong economic development and has enjoyed special interest from the Moroccan State (USD 11.6 billion is to be invested for infrastructure in the Tangier-Tetuan-Hoceima region according to APDN, 2016) and from international investors drawn by fiscal incentives. From the energy point of view, many wind energy projects have been erected and some have been in operation since 2000. In fact, the region has 276 MW operating wind farms and

another 320 MW is scheduled for before 2020. The region's wind economic potential is assessed to be of 1,000 MW. In Taza, which belongs to central Rif and the Fez-Meknes region, a wind farm of 150 MW is to be erected before 2020. The Rif region is traversed by a gas pipeline from Algeria to Spain (Gazoduc Maghreb-Europe: GME), two combined cycle power plants of 452 MW (Ain Béni Mathar) and 384 MW (Tahaddart) were installed and operate with natural gas.

In addition to the combined cycle power plants, the grid interconnections with Spain and Algeria located in the Rif region provide more flexibility to the local grid and, consequently, to the national grid and provide reserve capacity. The first interconnection with Spain was established in 1997 and the second in 2006 via 400KV under-water cables through the Gibraltar strait and connecting to the Moroccan grid in Tangier. The total capacity of the Morocco-Spain interconnection is 1,400 MW, with 750 MW already under commercial agreement between the two countries. The first electrical interconnection Morocco-Algeria was established in 1988 via 225kV overhead lines and the second in 2008 via 400kV overhead lines with a total capacity of 1,500 MW. Other possible interconnections between Morocco and Portugal are still being studied.

4.4.1 Hoceima

The energy demand in Hoceima is noticeably low compared to Nador and much lower than the energy demand of Tangier-Tetuan-Hoceima. The fact is that the energy demand in Hoceima is mostly domestic and the economic development is slow. In 2015, a development plan, «Hoceima, lighthouse of the Mediterranean Sea" (USD 704 million, 2015-2019), was launched by inter-governmental services before His Majesty the King of Morocco. The four-year plan is intended to align the area with the other sub-regions in the Northern provinces at the level of infrastructure and services. In 2017, His Majesty the King of Morocco received a report on the progress of the development plan from the supreme court of accounts and took executive decisions that will catalyse the speed of economic development in Hoceima. The development model proposed in that plan focuses on five main areas, namely the territorial upgrade, the promotion of the social environment, the protection of the environment and risk management, the strengthening of the infrastructure and the development of cultural space. The development plan goal is to enhance the tourist potential of the area and to bid on its natural and cultural diversity (seaside tourism, rural tourism, cultural tourism and eco-tourism) and, consequently, to overcome the seasonality aspect of tourism linked to Hoceima citizens living abroad coming home for their holidays. Thanks to those summer returnees, the city has experienced growth in tourism and infrastructure related to tourism over the years.

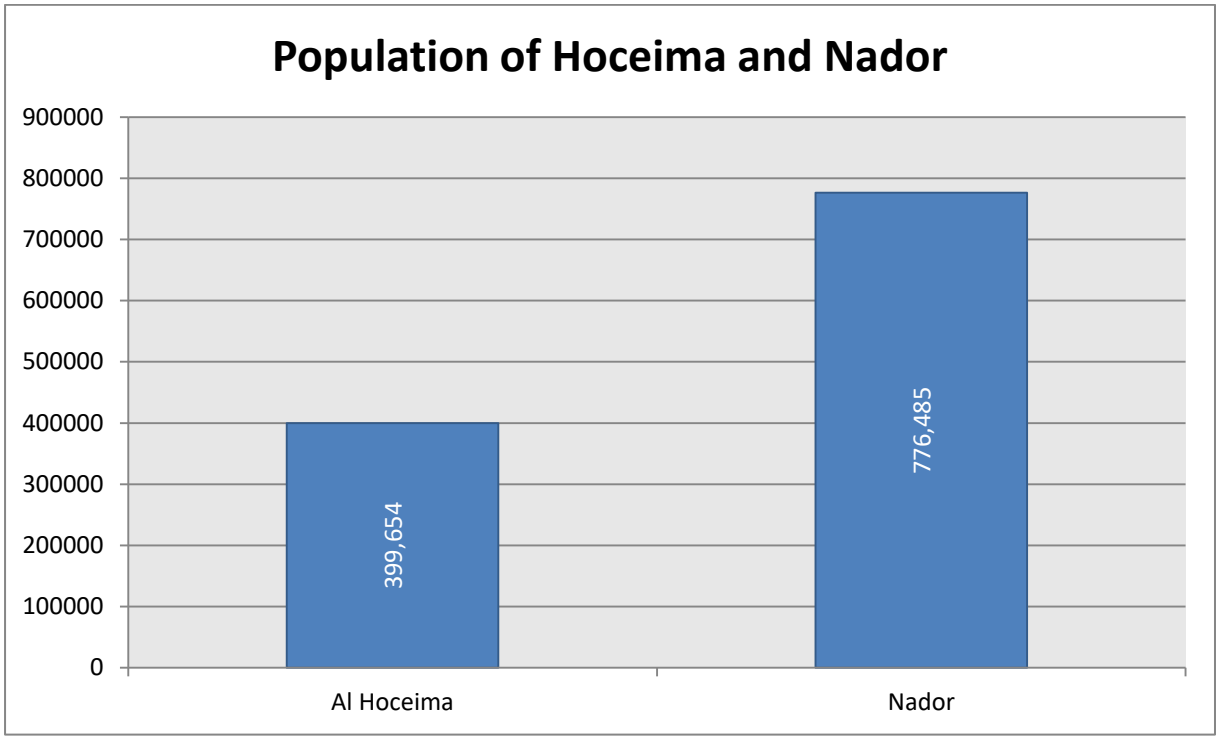


Figure 18: Population of Hoceima and Nador in 2014 (Nador includes Driouch)
Source: Census of 2014

4.4.2 Nador

Nador's demand for electricity is twice that of Hoceima's. Nador's electricity demand is expected to increase in the next few years. Since 2014, a regional strategic plan has been in place to enhance economic and social development in the region. The keystones of this plan are:

- Creating a Free-trade zone in Nador and Selouane;
- Construction of a commercial port in Nador;
- Duplication of the road between Nador to Oujda;
- Construction of the railway line Taourirt - Nador and the highway Fez - Oujda;
- Completion of the Mediterranean motorway;
- Creation of two international tourist destinations (one in Saidia and the other in Nador); and
- Setting up a technology park in Oujda dedicated to renewable energy and clean technology.

The new vision of regional development resulted in a new pole of development in the east of the country - the "Pole Mediterranean East" / "MED East", based on structural development plans and the mobilisation of the local active forces of the Region, this economic pole is intended to compliment the new "Pole Tangier Med". A project company, "Nador West Med" (NWM), was created to develop a commercial port that includes an integrated industrial complex, made up of a free-trade port and a free-trade industrial platform over an area of 1,500 hectares and an area of development outside the free-trade zone on an area of about 2,500 ha. The total investment estimated for this project is more than USD 7.05 billion.

Another indicator of the strength of the Rif region is the private bank activity. Nador has the highest number of banks per inhabitant in Morocco. It is the third in Morocco in terms of deposits collected, with 3.7 billion USD, i.e. more than 5% of the deposits collected nationally (based on 2012 data). Only 17.5% of the deposits collected in Nador are redistributed in credit. In Hoceima, at the end of the year 2014, the deposits collected were about 0.91 billion USD, with only 11.9% of deposits redistributed in credit.

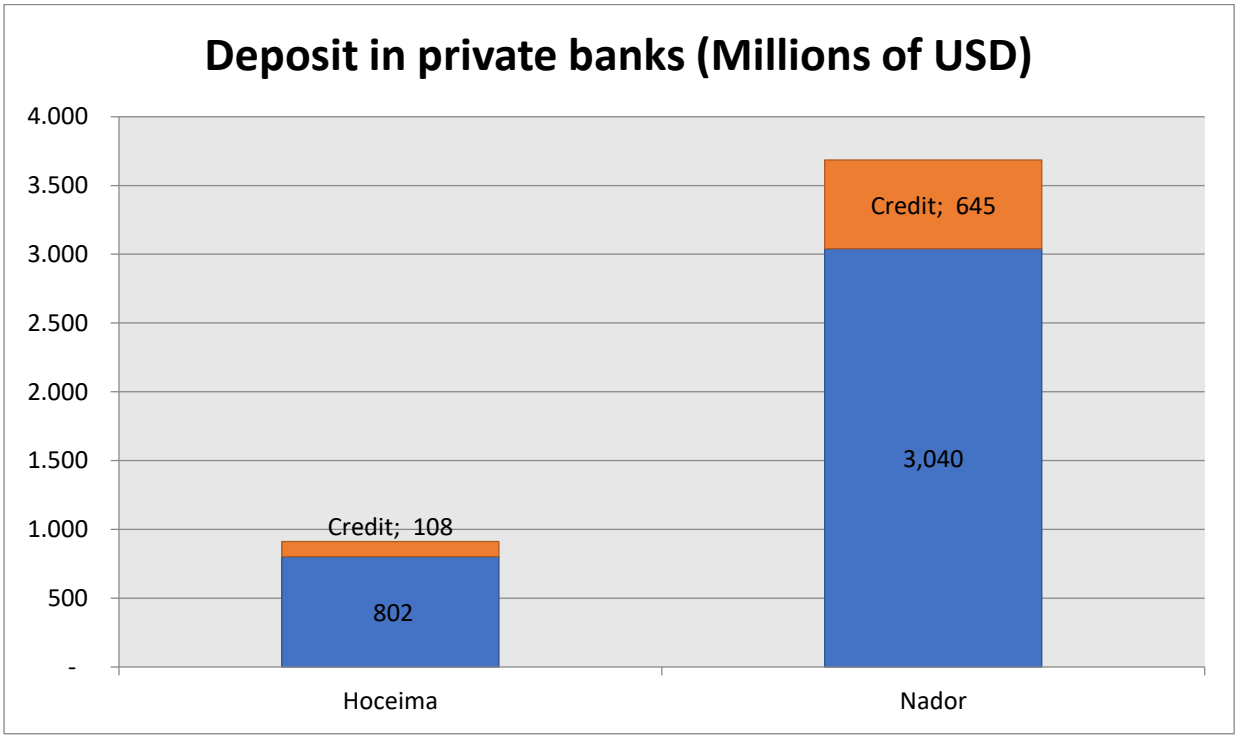


Figure 19: Deposit in private banks in Hoceima and Nador

Source: Mongraphie Hoceima, HCP, 2017 (data of 2014) et Monographie économique de Nador, CCISN, 2012 (data of 2012)

The Rif region has a long-standing relationship with the Netherlands through immigration and integration of thousands of Moroccans from the Rif region settling in the Netherlands. The region is still underdeveloped compared to other regions in Morocco. In addition the Moroccan government is actively looking for partners to work towards developing the Rif region that's full of many natural resources that are currently under-exploited.

4.5 Impact of regulation on SMEs in Renewable Energy

One of the most important hurdles for SMEs (both national and foreign) is the regulation surrounding the renewable energy sector. The regulatory framework varies depending on the type of energy source, as discussed in further detail in this chapter. One regulation limitation to the entire sector is the centralisation of the electricity grid. The Rural Electrification Programme (PERG), a national programme led by ONEE, was aimed at electrifying the country's rural regions. This mandate was outsourced to TEMASOL, a joint venture between the French oil and electricity companies Total and EDF (Electricite de France).

Through law 13-09 Morocco seeks to provide a regulatory framework for any individual or business in rural areas to sell power to the electricity network themselves, as such addressing the regulatory barriers to selling power to the national grid. In the first instance, the rural electrification programme wasn't intended for water pumping, which is a necessity for farmers in rural areas. The main reason for needing power is for pumping water.

The largest PV units installed by ONEE contractors are 600W, while pumping requires at least 15 KWh. The rural electrification programme only allows for rural areas to buy electricity from ONEE instead of creating their own electricity. As a result, the rural electrification programme is simply moving wealth from the rural to urban areas, thereby defeating the purpose of full autonomy of accessing electricity. Such an approach overcharges the grid and increases the dependency spiral from rural areas on urban cities in Morocco. Opening up the sale of electricity to the market, as in most countries in the world, could entirely change the renewable energy sector in Morocco.

Another challenge in the current regulatory framework is that, in the most official terms, it doesn't allow the transportation of energy from point A to point B, or at least it makes it extremely difficult for producers to work effectively within the regulations. While transporting tomatoes in Morocco is facilitated by simple regulation, transporting power is another hurdle for power producers.

4.6 Importance of renewable energy to the economy

The current renewable energy sector in Morocco constitutes wind, solar and hydroelectric energy, with the implementation of law 13-09 set to open up these markets to foreign investors,. The annual energy consumption per capita is 0.5 TOE (tonnes of oil equivalent), increasing by 4.3% every year. The electricity consumption per capita is 781 kWh, increasing annually by 7.8%.

The renewable energy market is not only important to the Moroccan market but also to the entire African continent, with 634 million Africans lacking access to electricity. Morocco is actively investing in renewable energy, not only bringing technology and innovation to Morocco, but also to the rest of the continent. Renewable energies are an adequate solution, especially low and medium PV, which also have high job-creation potential. Hence, the importance of renewable energy in Morocco is equated to the importance of renewable energy to the African continent as a whole.

Morocco's continuous average GDP growth of 5% combined with an annual electricity growth of 6.5% and the high dependence rate on energy imports (95%) has developed into a national strategy for renewable energy as 2 objectives become very important within this context. Firstly, Morocco needs a secure energy supply to meet future demands, both on the internal and external markets. Secondly, in the long-term, Morocco's positioning as a leader in renewable energies is only solidified by its actions. These 2 objectives have led to Morocco's diversification of resources, thereby minimising its dependence on hydrocarbons. To this extent, the direct use of renewable energy is the main channel in moving from 34% of electrical power from renewable energies in 2015-2017 to achieving 52% in 2030.

Renewable energy companies operating on the African continent are among the most successful businesses in Africa due to the high demand for a constent supply of energy. This increased demand can also be attributed to increased urbanisation and industrial growth.

4.7 Value Chain Structure

The best approach to understanding the complex ecosystem of renewable energy in Morocco is to better understand the positioning of each important player (government agencies, private domestic and foreign suppliers). The renewable energy market in Morocco is mostly administered by the state (ONEE), except for a small amount, 300-400 MW, produced by the private sector (under the law 16-08) for their own electricity needs. Wind, solar and hydroelectricity are the main subsectors in the Moroccan market. Wind, solar and hydro projects are implemented through public-private partnerships in which the developer sells the generated power via a specific power purchase agreement (PPA) to ONEE, the national electricity agency.

4.7.1 Solar Energy

Solar energy is the most promising market in Morocco. Morocco has 180 MW of solar projects in operation and more than 1800 MW in development. Currently, 2% of electricity power is obtained via solar energy, but the national strategy is to increase this to 20% by 2030. With all factors taken into consideration, Morocco has the capacity to produce a lot more energy from solar energy.

MASEN is the overarching administrator of the large solar energy projects (as well as other renewable energies, since 2016). MASEN develops power plant projects through calls for proposals. The Noor projects (see below) are deployed in the framework of an IPP (independent power production) structure.

Table 8: Noor Projects

Project	Capacity (MW)	Technology	Price	Status	Developer	Cost
Noor Ouarzazate	510 MW in CSP/ 70 MW in PV	CSP and PV			Acwa Power	
Noor Tata	300 MW in CSP/ 300 MW in PV	Hybrid: CSP/PV				
Noor Midelt: 2 hybrid plants for the 1st phase	300 MW of CSP (PV Capacity defined by the developer	CSP/PV	Tbd	In pipeline: ongoing evaluation of the bids	Tbc	USD 2 Billion

Source: MASEN

MASEN raises financing from international development agencies, eventually to re-lend it to the developers. This helps reduce the cost of debt and, by extention, in view of the security provided, the eventual cost of electricity to end-consumers. Morocco follows the BOOT (Build-Own-Operate-Transfer) approach, which allows for developers to apply 3.5% debt instead of 7.5% from commercial lending. Within this scheme, MASEN chooses developers offering the lowest bids (no exceptions). The calls for proposals are open for all developers internationally (In general all announcements of public tenders should be published on the website: https://www.marchespublics.gov.ma and on the concerned institution's website). The most impactful business opportunities in the solar energy occur within these sub-markets:

- Low and medium voltage PV;
- Energy efficiency;

- Grid integration; and
- Smart grids.

A. Low- and medium-voltage PV

Due to delayed 13-09 law, the low- and medium-voltage PV market, i.e. amount of energy produced to service these segments of the market, is currently small (2GW from solar energy in 2020) in Morocco. Specifically, low- and medium-voltage solar PV lacks a remuneration policy scheme, be it a feed-in tariff (FIT), net-metering or a self-consumption scheme. This remuneration framework is of high importance to foreign investors and is to be implemented in 2018. This remuneration framework would offer interesting business opportunities to Dutch companies in the low- and medium-voltage PV space.

Law 13-09, amended and complemented by law 58-15, will give an opportunity to integrate PV or Combined Heat Power (CHP) plants to the grid with the possibility of selling the production to ONEE / Utilities. The idea is to increase the production capacity for this segment by providing the right incentives to IPP or the private sector. The law gives a degree of flexibilty to the PV system owner, which may be a household or a small business.

B. Energy Efficiency

AMEE (National Agency for Energy Efficiency) is the primary agency mandated with energy efficiency in Morocco. They have also introduced a thermal regulation for buildings within the national energy efficiency programme in collaboration with the UNDP. The regulation attempts to increase the energy performance of buildings in terms of cost, CO_2 and customer price. AMEE also publishes all its tenders for both national and international companies.

The SDLs (Local Development Cooperation) shown in figure 20 are another promising move promoted by AMEE for municipalities' energy efficiency. An SDL is a company form developed to improve on efficient use of energy at municipality level which then allows for the country to equitably share the risks and benefits of the energy efficiency investment. The bottom line of this form is to give the private company the possibility to invest in energy efficiency systems for a municipality service (for example, street lights) and share the benefits later on.

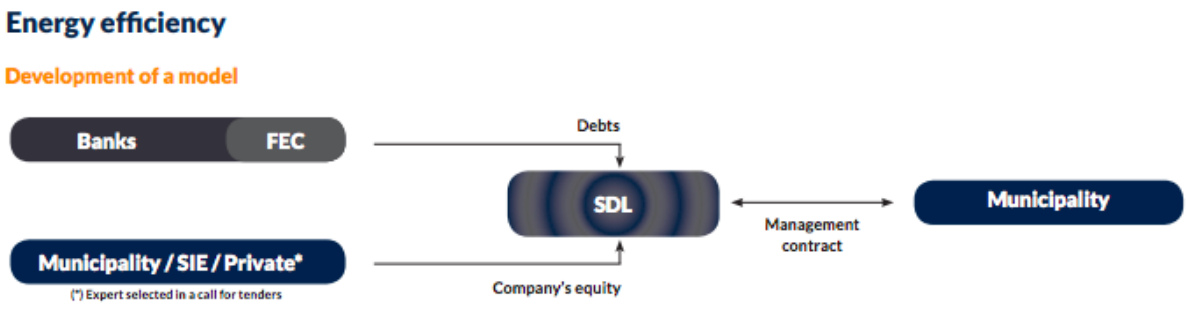


Figure 20: Energy Efficiency

The energy efficiency space is a possible route into the Moroccan market as there's practically no regulation restricting energy efficiency projects. Companies can collaborate directly with AMEE and / or create their own projects and demand AMEE's collaboration.

In combination with AMEE's energy efficiency bids, it is recommended to partner with the industrial sector representing metal, plastics, transport, construction, etc., in creating energy-efficient solutions for industry, as there is the possibility of getting discounted loans from Moroccan banks and incentives from SIE for such projects.

C. Housing Sector

As a result of poor design and lack of insulation in the housing at different social classes, reverting to heating in winter and portable air conditioners during summer adds unnecessary costs to household budgets. The Ministry of Housing aims to build 100,000 public housing units each year, while integrating basic energy efficiency (EE) standards in line with the Energy Efficiency Code norms for buildings in Morocco. The thermal regulation law (RTBM), coupled with the social housing tax incentives[10], is a viable investment opportunity for foreign investors. This law requires future housing, especially social housing, to abide by the thermal regulation law for construction. Hence, a collaboration with Omrane, a state-owned real-estate company, is to be recommended to Dutch companies with interest and expertise in energy efficiency in the housing sector. "Binayate", software developed by AMEE, is entended to help architects and building construction companies to insure the compliance of their projects with the thermal regulation of buildings law in his active and passive components. This software will determine the annual consumption of the building in KWh per m^2 per year and greenhouse gas emissions in kg of CO_2 per m^2 per year.

D. Health Sector

Public hospitals are undergoing extensive refurbishment of the health infrastructure to improve the quality of health services. As most hospitals operate under limited budgets, the quality of services correlates closely with energy costs (hot water, lighting, heating and cooling services). For example, hospital incinerators can be designed to operate in a much more efficient way in terms of energy consumption. An incinerator in Marrakech uses approximately USD 4,300 per year in energy (32,000 Kwh of electricity - and 6.7 KW of peak power - and 56 MwH of thermal energy). It is estimated that only 20 of the top 120 Moroccan hospitals have hot water for basic services, thus increasing the possibility of health risks. While the government has announced the launch of a Compulsory Health Insurance programme, public hospitals are seeking to upgrade the quality of their services and the government now understands that patient comfort and availability of hot water improve the overall quality of medical services in many ways. Furthermore, given that the Ministry of Health is empowering the management of public hospitals, it can be assumed that the process for obtaining approval from the hospital board to support energy savings will be simplified.

The health / energy efficiency nexus is one that is underrated in Morocco. Due to the increasing competitiveness of (public and private) hospitals, the reduction of energy costs could determine a hospital's position in the market.

[10] Social Housing Tax Incentives: 1) Companies are exempted from corporate tax (30%) and VAT. 2) Administrative Fast Track: Investors benefiting from an agreement with the government receive an administrative fast track.

4.7.2 Wind Energy

The first wind farm in Morocco was installed in 2000 with a capacity of 50.4 MW in El Koudia El Baida (Tlat Taghramt – Province of Tetouan), situated 17km from the town of Fnidek. The annual energy production of this wind farm is approximately 200 GWh/year, which is equivalent to 1% of the national annual electricity consumption. In 2007, 60MW Amogdoul wind farm, on Cap Sim south of Essaouira, came online. This wind farm was realized by the national utility copmany ONEE and is currently producing approximately 210 GWh/year. Another landmark project in Wind energy in Morocco is the 140 MW at Allak, El Haoud and Beni Mejmel, near Tangier and Tetouan which was commissioned in 2010 with annual an production capacity of 526 GWh per annum. In fact, Morocco has a strong pipeline of wind power projects to realize its objective of 2GW of wind power by 2020. Morocco's wind power development plans were given a further boost with the 301 MW Tarfaya wind facility, becoming operational in 2014. Tarfaya Wind farm is comprised of 131 wind turbines of 2.3 MW each. Tarfaya's 301 MW wind farm provides 15 % of the total energy required for Morocco to meets its 2,000 MW target by 2020. It was built at a cost of approximately $700 million to meet the power requirements of several hundred thousands people and is expected to reduce 900,000 tonnes of CO2 emissions each year.

In December of 2015 ONEE awarded an 850-MW tender bid to a consortium led by Italy's Enel Green Power alongside Nareva Holdings and Siemens Wind Power. The bid averaged $0.03 per KWh, this was a new record for low wind energy pricing globally. "This record is a result of Morocco's exposure to Atlantic trade winds combined with a downward price movement in wind technologies and strong financial mechanisms", Tawfik Laabi, strategy director at ONEE, told OBG. "The price of wind energy technologies have dropped by 15-20% since 2009. By comparison, wind projects are now cheaper than coal, where the price averages $65 per MWh," he added.

The tender includes five projects: 150 MW in Tangiers, 300 MW in Tiskrad near Laayoune (WS), 200 MW in Jbel Lahdid near Essaouira, 100 MW near Boujdour (WS), and 100 MW at Midelt, 400 km east of Casablanca. Commissioning of the projects is expected in 2020. As is the case with solar energy, all wind energy projects are developed under the BOOT approach through public-private partnerships. Please see below details of the wind projects in progress or to be launched soon (under the law 13-09).

To further facilitate the nation's wind industry, Siemens, a global technology and engineering company, is building a blade factory for wind turbines in Tangier. The factory will serve the MENA and European wind markets. Source: (MASEN) 2017.

Table 9: Wind Projects

Project	Installed Capacity	Price of kWh	Developer	Year Awarded
Taza Wind Farm	150 MW	USD 0.05/ kWh	EDF/ Mitsui	2012
Tarfaya Wind Farm	301 MW	USD 0.07/ kWh	Tarec (JV Nareva/ Engie	2014
Tanger 2 **Tanger** **Jbel Lahdid** **Midelt**	150 MW 300 MW 200 MW 100 MW	USD 0.03/ kWh	Enel/ Nareva/ Siemens	2016

Since 2016, MASEN has taken over the management of wind power projects in Morocco from ONEE. Wind energy will play a crucial role in helping Morocco meet its renewable energy targets. Morocco has an estimated 25,000 MW of technical potential for wind generation, but as as early 2016, only 800 MW had been installed[11].

4.7.3 Hydroelectricity

Unlike the other renewable energies, Morocco already has the infrastructure for hydroelectricity. The current installed capacity is 1,770 MW, through 26 ONEE-operated hydro power stations. The hydroelectric potential is estimated at 3,800 MW. In partnership with ONEE, Energie Terre develops and exploits several hydroelectric production sites and is building the first micro-hydropower plant in Morocco, at Midelt. Energie Terre has become the reference name in hydropower in Morocco.

Hydroelectricity projects are generally carried out by ONEE, which recently identified a further 125 sites suitable for locating small- or micro-hydropower plants (100 kW to 1,500 kW), with a total potential capacity of around 300 MW. Private electricity producers might find these sites attractive and decide to develop them themselves.

For private project developers, within the hydropower market, the opportunities are concentrated around small projects / micro-hydropower plants. Considering the fact that the clients are local governments, the companies carry the full risk. Maximum production has recently been increased from 12 MW to 30MW.
Platinum Power[12] will reach 150MW in the next year through the dams in the Oum Rabi bassins. The hydropower market is characterised by green investors' equity and PPPs in building water dams across the country.

Foreign investors are recommended to contact directly the Public-Private Partnership committee[13] within the Moroccan government in order to develop water dams. There are currently 76 dams being built in 2018/ 2019, totaling 1,000 MW.

4.7.4 Water/ Energy/ Agriculture Nexus

The agri-business represents **19%** of the total GDP in Morocco. Employing **11 million people**, the sector is the largest employer in the economy.

[11] Masen, The Basics, Moroccan Agency for Solar Energy, http://www.masen.ma/en/lerecit/

[12] Platinum Power is an operator exclusively focused on the development, financing, construction and operation of renewable energy production projects in Africa. A true pioneer in the sector, this independent energy operator is present in Morocco, Côte d'Ivoire and Cameroon, with a current pipeline of close to 1,000 MW in hydro-electrica and wind projects. Platinum Power is a Moroccan company, the leading shareholder of which is Brookstone Partners, the American investment fund. Based in New York, Brookstone Partners has been present on the continent since 2009, through its African entity Brookstone Africa, the first entity ever to receive the Casablanca Finance City label in Morocco.

[13] https://library.pppknowledgelab.org/documents/3856?ref_site=kl

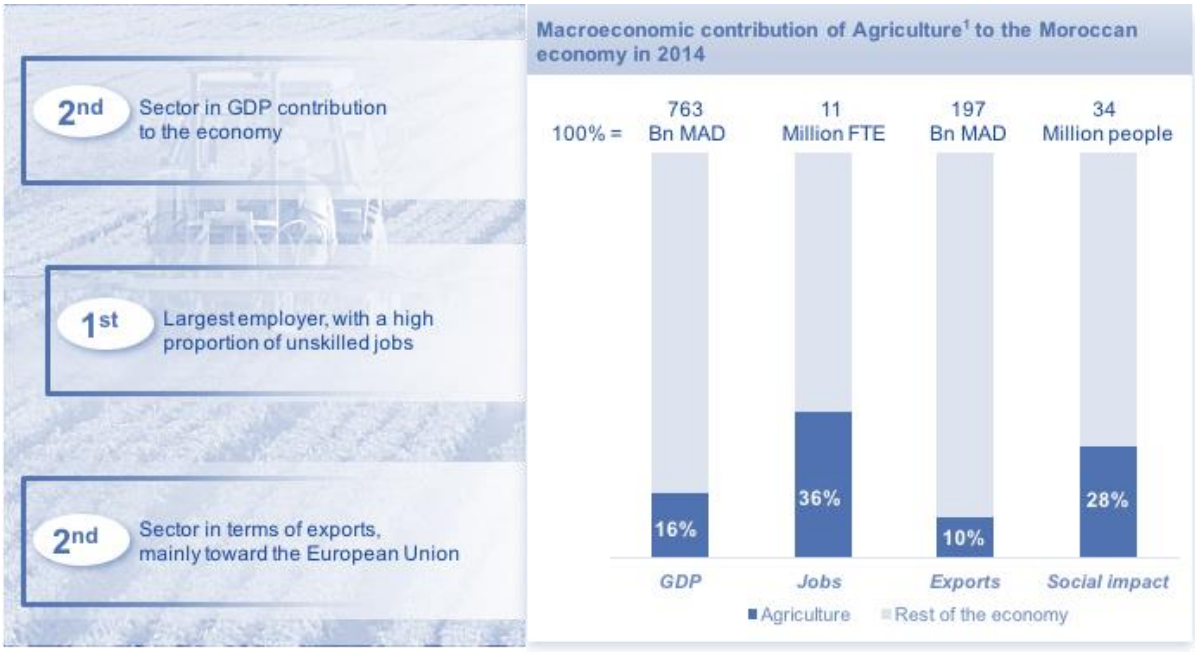


Figure 21: Contribution of Agriculture to GDP

Source: Ministry of Finance, National Statistics Institute, Central Bank, Ministry of Agriculture (1 Including Agriculture and Agribusiness and excluding Fishery)

In order to achieve the government's Green Strategy (Plan Maroc Vert) by 2020, the 2017/18 Agricultural Campaign has taken a few measures:

- Preparing an area of 594,000 hectares for large-scale irrigation; and
- Planning and monitoring of the allocation of irrigation water quotas (3.22 billion m^3) to ensure the cereal crops and sugar plantations, and to secure water for fruit production.

The water / energy / agriculture or food nexus is of interest to the entire world, but especially to the Moroccan market. As agriculture is the largest consumer of freshwater resources, the water / agriculture nexus is very clear. Here, the need for renewable energies to operate high-energy consumption desalination and water transmission systems is essential.

The water / energy nexus is another subsector with regulatory challenges. In short, water in Morocco is subsidised, giving access to water to all households, but this same water is also used for industrial purposes. As industrial players use butane gas pumps for water, they benefit from low prices intended for individual households. For industrial players, there's ample incentive to change this approach and the regulatory framework doesn't offer limits on the use of butane gas pumps for industrial purposes.

Independent water and power producers (IWPPs) and EPC (Engineering, Procurement and Construction) companies want to enter this nexus market by producing clean and competitive water and energy but are limited by the high CAPEX (capital expenditure / apply tenders costs) of existing technologies. Water production from desalination with renewable energies and water treatment are aligned with the strong needs and objectives of the Ministry of Agriculture's national strategy.

4.7.5 Biomass to energy

Biomass is under the control of municipalities (or “communes”), as such businesses can work directly with the municipality council. An important prerequisite for (Dutch) companies to do business in biomass in Morocco is that municipalities foot the cost of incineration facilities. Financial provisions for collecting trash in Morocco have been made but there are no provisions made for cost associated with converting waste to energy. Municipalities are under pressure to cover such costs and with the formation of the 12 regions it is the best time to intitute changes that would incentivize municipalities to cover costs for converting waste to energy.

In the framework of public-private partnerships, the Dutch government could offer a municipality council to subsidise a part of the cost for such waster-energy conversion, while hiring a Dutch company to do the work. There’s certainty that Mr. Bakkoury, president of MASEN and president of the Casablanca municipality, would be interested in such a partnership for the city of Casablanca.

The two advantages to production and use of biomass in Morocco are as follows:

- Biomass provides energy on demand, requiring only a generator and to sell electricity directly for / to a specific purpose / organisation. In this particular market, the company isn’t reliant on the electricity grid. This gives businesses tremendous freedom and independence; and
- Biomass is one of those markets being pushed by some very large companies in Morocco, such as MASEN, which are interested in public-private opportunities in biomass.

5. Dutch Renewable Energy Sector

The Netherlands is working on a transition towards sustainable, reliable and affordable energy for everyone. To achieve this transition, the Dutch government has entered into an Energy Agreement for Sustainable Growth with over 40 Dutch organisations, including employers, trade unions and environmental organisations. The short-term objective of this agreement is to increase the share of renewable energy from 5.9% in 2016 to 14% in 2020 and 16% in 2023.

Besides this transition within the Netherlands, many Dutch companies are working on renewable energy solutions abroad. This chapter gives an overview of those companies, especially those who supply possibly relevant solutions for Morocco. This includes companies in the field of solar (see paragraph 5.1), wind (see paragraph 5.2) and biomass, geothermal and other renewable energy solutions (see paragraph 5.3).

5.1 Solar

Back in 2010, the Dutch solar energy market was a relatively small and innocent market. Ever since, this market has grown at a vast rate. Simultaneously, Dutch solar energy related companies with an international focus have strengthened their positions abroad. Together these two developments have given rise to a strong and significant Dutch solar energy sector, which today has an annual turnover of about EUR 2.5 billion. This chapter gives an overview of the Dutch solar energy sector, starting with its home market and proceeding with its export power.

5.1.1 Home Market

Although there are various Dutch companies successfully supplying solar thermal solutions (see examples further down this chapter), the growth of the solar energy market within the Netherlands is mainly about solar photovoltaics (PV).[14] Roughly, two factors are behind this growth: the strongly decreased prices of solar panels and related components and a stable policy regarding net metering[15] (in Dutch: *salderen*).

While the first one is an external factor, the second one clearly is an internal factor. Combined with the decreased prices, the net metering policy has ensured a stable business case for solar panels on the rooftops of small electricity consumers in the Netherlands like households, SMEs and primary schools. These are therefore the places where still most of the solar panels in the Netherlands can be found.

For larger projects, either for solar energy or for other renewable energy technologies, SDE+ (Stimulation Renewable Energy production) subsidy is available. This subsidy can be applied for in phases, with a fixed budget being available for the total of all applications. If you apply in the first

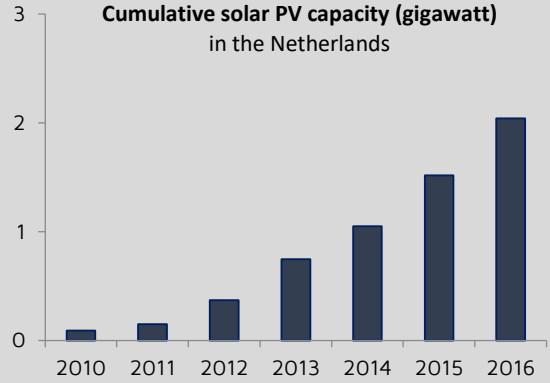
[14] Solar PV (photovoltaics) refers to the conversion of sunlight to electricity: 'photo'refers to light and 'voltaic' refers to electricity. Another type of solar energy is solar thermal, which refers to the conversion of sunlight to heat (e.g. hot water). A combination of these two types is often indicated as PV-thermal or briefly PVT. When sunlight is concentrated, for instance with mirrors, the term concentrated solar is used. Examples of combinations includes concentrated solar power (CSP) and concentrated PVT (CPVT).

[15] Net metering is a policy that allows consumers to feed-back or consume electricity to or from the grid anytime and to pay only for their net electricity consumption per annum. In the Netherlands, net metering is only allowed for consumers with a small electricity connection (up to 3x80 Ampère), which includes mainly households.

phase, the maximum amount of subsidy per unit of energy is the lowest, but the chance of getting the subsidy before the budget runs out is the highest. In a later phase, the maximum amount of subsidy per unit is higher, but the chance of getting it before the budget runs out is lower.

This system ensures that the projects that need the least amount of subsidy per unit have the highest chance of getting this subsidy. Especially over the past few years, this SDE+ subsidy has become very popular among solar PV project developers. As a consequence, next to the many relatively small net metering projects, more and more large solar PV projects have found their way to the Dutch grid.

Box 1 – Solar PV in the Netherlands (source: CBS, Statistics Netherlands)





Sunports in Delfzijl is a 30 megawatt solar farm, providing power to the nearby Google data centre (© Groningen Seaports)

5.1.2 Solar panels and collectors

Thanks to the Port of Rotterdam, the Netherlands is a significant trader in solar panels. By far, most solar panels that are traded are not produced in the Netherlands, but the country does have some producers of solar panels that stand out from the crowd. Examples of Dutch companies in this category are Energyra, EXASUN, HyET Solar (thin film), Kameleon Solar and TULiPPS for solar photovoltaic (PV) panels and Solarus (see Box 2) and SunCycle for combinations with concentrated solar power (CSP) and thermal applications (PVT).

Box 2 – Solarus (© Solarus)

Solarus develops, manufactures and supplies innovative 'PowerCollectors', which concentrate sunlight for both solar PV and thermal energy purposes. These collectors harvest up to 70% of the energy from the sun. On average, they produce about three times more energy from a surface than conventional solar panels.

Since the PowerCollectors produces both heat (hot water up to 70 °C) and electricity, the following sectors are ideal for Solarus: hotels and resorts, industry (food processing, process industries, laundry) and residential (housing projects, apartments, district heating). The technology can also be used for cooling and food refrigerating purposes.

So far, over 3,000 PowerCollectors have been installed in more than 60 projects around the world. In August 2017, the company received 6.7 million euro of additional funding.



5.1.3 Production lines

The Netherlands has a long history and steady track record in the field of solar PV research. For instance, already in 1950s solar PV research was performed at Philips, experimenting with the first solar powered transistor radio. In 1981, the first solar PV factory in the Netherlands was built (Holescon Components B.V. in Helmond), followed by pioneering projects like the first large scale PV project (50 kilowattpeak) in Europe in 1983 (Terschelling) and a fully off-grid solar powered house in 1988 (Castricum) which has been in operation for more than 25 years without any outage.

Based upon this long track record and the research that is performed today by for instance ECN, TNO and the Technical Universities of Delft, Eindhoven and Twente, the Netherlands has a strong position in the worldwide production chain of solar panels. If you step into a solar cell or solar panel factory anywhere in the world, there is a good chance that you will find Dutch production machinery or even full Dutch production lines.

"Rimas Technology Group supplies production machines for Turkish and Algerian solar panel factories"

Box 3 – Solar Magazine (October 12, 2017)

"Millions-order [200 megawatt to 1 gigawatt production line, red.] for Dutch solar cell machine builder **Tempress**"

Box 4 – Solar Magazine (March 2 and May 10, 2017)

5.1.4 Testing equipment and software

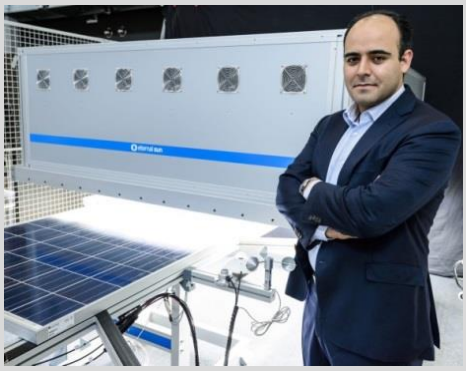
Besides production machines, solar factories around the world are also making use of testing equipment and software from the Netherlands. Examples of Dutch companies in this area are Celsian Glass & Solar, Eternal Sun (see Box 5), Hielkema Testequipment and XYZTEC.

Box 5 – Eternal Sun (© Eternal Sun)

Eternal Sun is a leading supplier of solar PV module testing equipment. Customers include renowned R&D institutions, certification laboratories and Tier 1 solar module manufacturers in about 40 countries worldwide.

The company has won numerous international innovation awards. In both 2015 an 2016, PV Magazine listed Eternal Sun as number 1 in the Top 50 game changing innovations in the solar industry. In 2016 Eternal Sun acquired Spire Solar in the USA.

Chokri Mousaoui is the founder of Eternal Sun. He is born and raised in The Netherlands, with Moroccan roots.



Chokri Mousaoui

5.1.5 Balance-of-system components

Solar is not just about solar cells and solar panels. In fact, there are many related markets. The Dutch company Victron Energy for instance has a worldwide market leading position in providing high-quality (back-up or off-grid) chargers and inverters. Examples of other Dutch companies in this area are Femtogrid, Heliox, Mastervolt and PR Electronics. Other examples of Dutch companies providing system components are Walraven and Esdec (mounting systems), DSM (anti-reflective and sand-resistant coatings, see Box 6) and Kipp & Zonen and Hukseflux (solar irradiation measurement).

Box 6 – DSM (FD, June 13, 2017)

"DSM develops sand-resistant coating for solar panels"

[…] "DSM claims the solution: a coating that does not stick to sand. Last week, the group sold its first sand-resistant coating for solar panels. Solar parks in desert areas from Dubai to Morocco are potential customers."

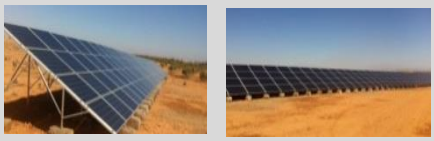
5.1.6 Turn-key solutions

Several Dutch companies have a strong position in providing turn-key (back-up or off-grid) solar PV solutions. Examples of these companies are Alfen, Bredenoord, DSE Group, Maru Systems, The Off-Grid Factory, Wattco and Zwart Techniek. Dutch companies particularly have a good position in

providing these kinds of solutions for water, agriculture or horticulture related purposes. Examples in this area are Elemental Water Makers, Nedisun (see Box 7) and Van Der Hoeven (see Box 8).

Box 7 – Nedisun (© Nedisun)

Nedisun is a Dutch company that designs and supplies solar pumping systems. Examples of applications include drinking water, irrigation and swimming pools. In Morroco, together with its partner Ultrasol, the company has several projects running.



Nedisun project near Guercif, Morroco

Box 8 – Van der Hoeven (© Van der Hoeven)

Van der Hoeven is internationally recognized as one of the major players within the turn-key horticultural sector. Since 1953, the Dutch company has been designing and realizing horticultural projects for investors, modern growers and developers all over the world. More and more, Van der Hoeven integrates solar in their projects, both solar thermal and solar PV. The picture on the left shows a project in Australia with 20 hectares of solar thermal collectors. The picture on the right shows a project with integrated solar panels in the roof of a greenhouse in the South of France. Van der Hoeven has installed more than 100,000 m^2 of these PV-integrated greenhouse roofs in the South of France.



Project by Van der Hoeven in Australia (crop: tomatoes)

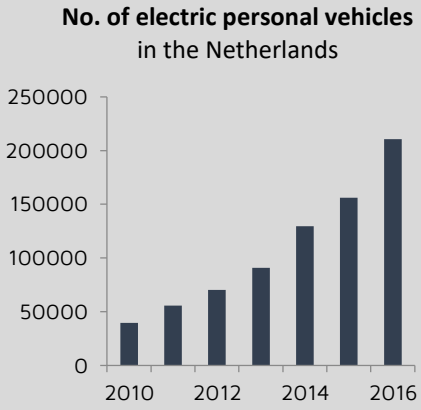


Solar greenhouse by Van der Hoeven in France

5.1.7 Integrated solutions in transport, infrastructure and buildings

Last but not least, the Dutch solar energy sector certainly has an eye for *Dutch Design*, for instance in applications for transport, infrastructure and buildings. For example, in line with the strong growth of electric vehicles (EVs) in the Netherlands, Dutch Design can be found in the development of charging stations for EVs and solar-powered cars (see Box 9). Also, solar PV is increasingly being integrated in infrastructure like roads (for example SolaRoad) and sound walls (for example Solar Highways) and in buildings (see building-integrated PV (BIPV) solutions of for instance BRS Building Systems, Prêt-à-loger, Scheuten, SolarSwing, Stafier Solar, ZEP and ZigZag Solar).

Box 9 – Link between solar and electric vehicles in the Netherlands (source: CBS, Statistics Netherlands)



One of the about 90,000 charging points for electric vehicles in the Netherlands, here with solar cells along the highway (© Fastned)



After winning the World Solar Challenge successive times, a fully solar-powered car is under development in Eindhoven (© Lightyear)



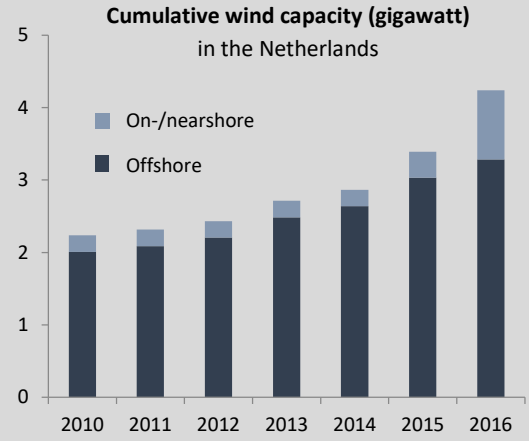
5.2 Wind

Internationally, the Netherlands is well-known for its traditional wind mills and the way it has used these wind mills to create a safe land that is for about one half below sea level. Today, the country is still a pioneer in using wind energy. Especially in offshore wind energy, Dutch companies have a strong export position, leading to a widespread involvement in projects worldwide.

5.2.1 Home market

In the Netherlands, the biggest share of the existing wind energy capacity concerns onshore or nearshore farms (see Box 10). Together, the farms have a capacity of 3.3 gigawatt (GW). Offshore wind farms account for about 1 GW, but this is about to change significantly over the upcoming years. In total, 3.5 GW of new wind farms are in preparation (see Box 11), which will lift the offshore wind energy capacity of the Netherlands to at least 4.5 GW in 2023.

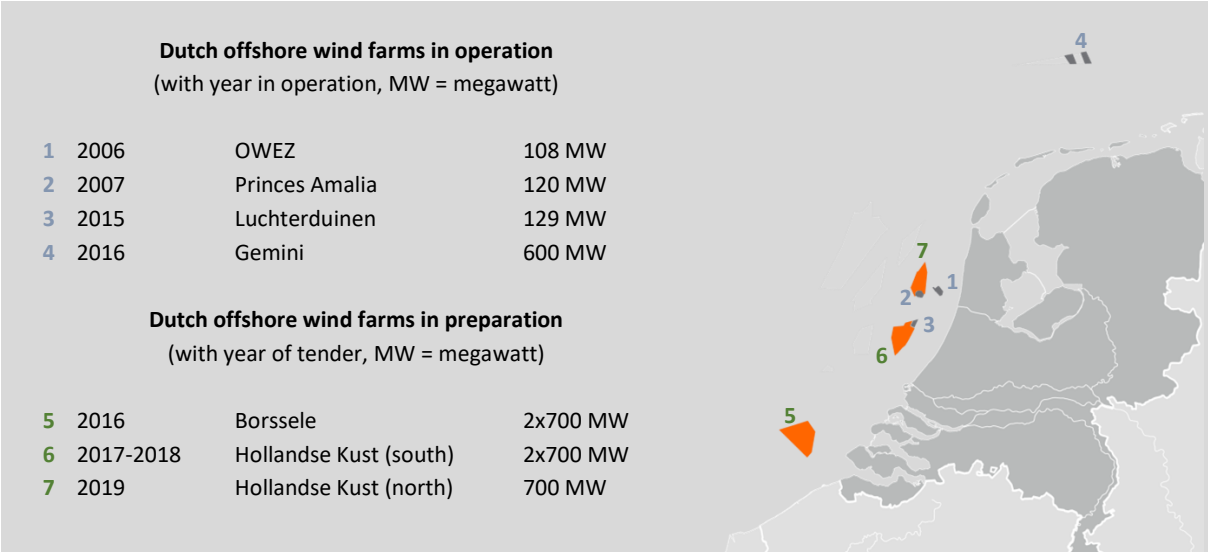
Box 10 – Wind energy in the Netherlands (source: CBS, Statistics Netherlands)





Nearshore wind farm Westermeerwind, 700 to 1,200 meters off the dikes in the IJsselmeer lake (© RVO.nl)

Box 11 – Offshore wind farms in the Netherlands (© RVO.nl)



This upcoming rise of offshore wind energy in the Netherlands is backed by a steady track-record of Dutch companies in offshore technology and marine operations. At the same time, it is to a large extent the result of a change in policy. In the past, there was little spatial planning from the Dutch government regarding offshore wind energy, leaving the developer in the lead. Developers chose their locations and concessions were given according to a 'first come first serve' principle. Today, the role of the Dutch government is much more pro-active. The government designates the wind farm zones, carries out site investigations, determines the conditions for building and operating a wind farm and then finally, issues tenders for subsidies in permits for these zones. In other words, today the government is in the lead. This change in policy has led to far less uncertainty for project developers, therefore far lower cost estimations and in the end, far lower demand for subsidies. The tender of the Borselle wind farms already surprised the world with the result of near-to-zero subsidies and the Hollandse Kust tenders might well result in zero subsidy.

5.2.2 Research, development and demonstration

Some of the world's leading knowledge institutes and universities with a focus on energy research and development (R&D) are based in the Netherlands. Many originate from university research groups and almost all have very close links to one or more universities and other education establishments. Examples at the forefront of offshore wind R&D are DOB-Academy, Deltares, ECN, MARIN, NIOZ, NLR, TNO, TU Delft / Duwind, Wageningen Marine Research (Imares) and Knowledge Centre WMC.

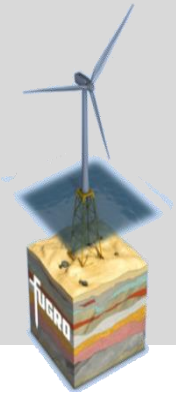
5.2.3 Consultancy, design and engineering

Internationally, the Dutch wind energy sector has a strong position in the development phase, including services like consultancy, design and engineering. Examples of Dutch companies working in this area, for instance designing wind farms or doing surveys, are Arcadis, BLIX, DNV GL, Ecofys, Move Renewable, Royal HaskoningDHV, Sweco and Wind Minds. Other examples, more specifically related to surveys (geophysical, geotechnical, ecology, etc.), are BMO Offshore, BOC MetOcean, DDC, DEEP, Fugro (see Box 12) and Skeye.

Box 12 – Fugro

Fugro is a Dutch multinational, providing geotechnical, survey, subsea, and geoscience services worldwide. The company has more than 10,000 employees an annual revenue of about 1.8 billion euro.

Fugro is involved with both onshore and offshore wind farms. Globally, the company has experience at over 100 offshore wind farms. Fugro is also doing surveys for the Borssele wind farms (see Box 11).



5.2.4 Wind turbines

Examples of Dutch companies supplying wind turbines and/or wind turbine technology are 2-B Energy, EWT, Lagerwey (see Box 13) and Mecal. Other examples, more specifically working in the area of wind turbine blades, are Pontis Engineering, Tres4 and We4Ce. In addition, there are several companies working in this area that are non-Dutch, but do have a branch in the Netherlands. These include for instance GE Renewable Energy's LM Wind Power, Siemens, SKF and Suzlon.

5.2.5 Foundations, cables and substations

A particular strength of the Dutch wind energy sector concerns the design and supply foundations of (especially offshore) wind turbines. This includes monopiles and transition pieces, floating structures, gravity based foundations, mooring, etc. Examples of Dutch companies working in this area are Blue H Engineering, Iemants, KCI The Engineers, MonoBase Wind, Sif Group, Smulders, VDS Staalbouw and Vryhof. Related strengths include the design and supply of subsea cables, for instance by CPNL Engineering, Primo, TenneT, TKF and VBMS, and the assembly, transport, installation and commissioning of substations, for instance by Heerema, HSM Offshore and Strukton.

Box 13 – Lagerwey (© Lagerwey)

Lagerwey is a Dutch designer and supplier of wind turbines, since 1979. Innovation is at the core of their success. Below are some examples of recent news articles to illustrate this point.

- *October 18, 2017 - "First hydrogen wind turbine for sustainable fuel to be sited in the Netherlands"* - "The 4.8 MW Lagerwey wind turbine will be converted to allow it to incorporate electrolysis technology."
- *September 14, 2017 - "Lagerwey wind goes solar"* - "Lagerwey has covered the entire roof of its new wind turbine factory in Barneveld with solar panels. In total there are 900 solar panels.
- *August 30, 2017 - "Lagerwey tests its Climbing Crane"* - "Lagerwey is currently testing the first climbing crane in the world for the installation of wind turbines in the Eemshaven."
- *June 19, 2017 - "Lagerwey technology used to power up Russian wind industry"* – "We are proud that we as a Dutch wind turbine supplier are instrumental creating a Russian wind industry".



The Climbing Crane



Solar on the new Lagerwey factory

5.2.6 Installation and commissioning

Next to the various Dutch companies designing and supplying foundations, cables and substations of wind turbines, there are also several Dutch companies who are specialised in the actual installation and commissioning. Examples of Dutch companies in this area (especially offshore) are Ampelmann Operations, Boskalis, DEME, Fistuca & BLUE Piling Technology, Heerema, Ice Vibro, Jack-Up Barge, Jumbo, MPI/Vroon, Royal IHC, Royal Wagenborg, Seafox, Seaway Heavy Lifting, SPT Offshore, Strukton and Van Oord (see Box 14).

Box 14 – Van Oord (© Van Oord)

Van Oord is a leading international contractor, specialized in dredging, marine engineering and offshore projects in the oil, gas and wind energy sector. The company was established in the Netherlands in 1868.

Recently, Van Oord realized one of the largest offshore wind projects in the world: the Gemini Offshore wind farm, 85 kilometers north of the coast of Groningen (see Box 11). As EPC contractor for this challenging project, Van Oord installed 150 4 megawatt Siemens wind turbines, the offshore high voltage stations and 150 inter-array cables. Gemini will supply renewable energy to 785,000 households. With a value of more than 1.3 billion euro, this is one of the largest EPC contracts in Van Oord's history.



Van Oord at work at Gemini Wind Park

5.2.7 Special vessels and tools

Because of the many challenges related to offshore wind energy, there are also companies who are more specifically focused on the design, engineering and supply of special vessels and installation tools. Examples of Dutch companies in this area are Barge Master, Bluestream Offshore, Damen, GustoMSC (see Box 15), Huisman Equipment, RR Maritime Engineering, SeaZip, SMST Equipment, TWD, Ulstein Design & Solutions, Vroon and Windcat Workboats.

Box 15 – GustoMSC in RE News (October 19, 2017)

"Dutch designs on US jack-up"

"Dutch [design and engineering company] GustoMSC has unveiled a new jack-up vessel design capable of installing the latest generation of 8 MW to 9.5 MW turbines and foundations in the US offshore market.

The [..] SEA-3250-LT jack-up is designed for a variable load capacity of 2600 tonnes and has the option to load two complete 8 MW turbines", the company said.



New jack-up vessel design by GustoMSC (© GustoMSC)

5.2.8 Harbor logistics and accommodation

Other specialised Dutch companies are for instance related to the harbor logistics, like BOW Terminal, MEO and Volker Stevin International (VolkerWessels) and accommodation, like C-Bed Floating Hotels and Chevalier Floatels.

5.2.9 Operation and maintenance

When it comes to operation and maintenance (O&M) of wind farms and related services, examples of Dutch companies are Bosman Inspecties, Croon, MME Group, Ned Marine Services, OutSmart, TOS, Van Aalst Group, and Ztechnologies.

5.2.10 Innovative designs

Last but not least, there are various Dutch companies working on new, innovative designs; not only for offshore wind, but also for onshore or nearshore wind. Examples in this area are Ampix Power, The Archimedes, the urban windmills of Airrush and the combined solar-wind PowerNEST of IBIS Power (see Box 16). The close linkages between the wind energy sector and Dutch research institutes and universities (see 5.2.2) supports these kinds of innovations.

Box 16 – PowerNEST (© IBIS Power)

PowerNEST is a multi-award winning product, designed by the Dutch company IBIS Power. The product generates both solar and wind energy. The product is particularly interesting for urban areas with high buildings, where optimal use of space is required.



5.3 Biomass, geothermal and other renewables

The Dutch solar and wind energy sectors, as described in the previous chapters, have much to offer when it comes to export. Still though, within the Netherlands, the biggest share of the country's renewable energy production is not related to solar and wind. This chapter therefore touches upon the position of other renewable energy technologies.

5.3.1 Biomass

At the moment, about 62% of the renewable energy usage within the Netherlands is related to biomass. This is significantly higher than the – arising but 'coming from far' – share of solar (5%) and wind (24%). About half of the 62% biomass share concerns incineration of biomass at the household or company level. The other half concerns the use of energy from waste (16%), biogas (9%), biodiesel (5%) and biopetrol (4%).

Compared to solar and wind, the growth of biomass within the Netherlands is relatively modest. Over the years 2010-2016, the usage of biomass has increased with a few percent per year on average. When it comes to export however, there are various Dutch companies successfully exploiting biomass-related solutions. Examples in this area are BTG Biomass Technology Group (consultancy and project development), Blackwood Technology (biomass torrefaction), Colsen (energy from waste water), EECT Turbomachinery (power stations on gas and green gas), Enki

Energy (bioreactors), Fuenix (waste to biofuel), Frames (biogas treatment and upgrading, see Box 17), Gastreatment Services (biogas), HoSt (biomass energy systems), Ingenia (consultancy), Kara Energy Systems (biomass combustion), Plospan (wood processing), Pure Air Solutions (removal of odour, H_2S and VOC), Royal Dahlman (biomass/waste-to-energy, gasification and gas purification), Thermaflex (thermal piping), TorrCoal (biomass torrefaction), Triogen (power from heat), SimGas (small-scale biogas), Upcycling Gemert (renewable heat from compost) and WTT (waste treatment systems).

Box 17 – Frames in Waste Management World (June 20, 2017)

"Frames completes 8 million cubic meter Dutch biogas upgrading plant in Beltrum"

"Dutch renewable energy firm, Frames Renewable Energy Solutions, a part of the Frames Group, has completed work on a biogas upgrading plant for manure processing specialist, Groot Zevert Vergisting in the Dutch city Beltrum. Frames was responsible for designing and supplying the biogas upgrading installation which can effectively remove H_2S from the biogas to below 3 ppm level."

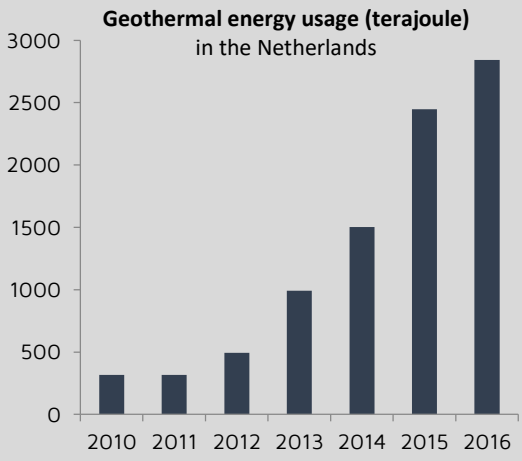


Biogas upgrading plant by Frames
(© Frames Renewable Energy Solutions)

5.3.2 Geothermal

Geothermal energy is heat that is derived from the inside of the earth, at a depth of more than 500 meters. Since the first geothermal installation in the Netherlands in 2008, the use of geothermal energy within the country has grown significantly, especially for heating greenhouses (see Box 18).

Box 18 – Geothermal energy in the Netherlands (source: CBS, Statistics Netherlands)





Geothermal energy in the Netherlands is mainly used for greenhouses

Examples of organisations involved in geothermal energy in the Netherlands are the government, EBN (gas and oil exploration, extraction and storage company on behalf of the State) and TNO (research institute). In June 2017, these organisations, together with seven consortia, signed the Green Deal Ultra-Deep Geothermal Energy. This is an important step to work further on ultra-deep geothermal energy in the Netherlands. The seven consortia are represented by Vermilion Energy Netherlands, FrieslandCampina, GOUD, Parenco/QNQ, Geothermie Brabant, Huisman Equipment and the Port of Rotterdam. Other examples of Dutch organisations working in the field of geothermal energy are Bakker Oilfield Supply, GERF, HVC, Hydreco GeoMEC, IF Technology, VB Geo Projects and WDA Pompen.

5.3.3 Hydropower

Since the Netherlands is such a flat country, it is not the most logical location to use hydropower. Nevertheless, the country has some small-scale hydropower stations, mainly making use of the flow of rivers throughout the country. The output of these stations does not come from high differences in altitude or high water speeds, but from the large amounts of water that are passing. In total, these small hydropower stations add up to an installed capacity of about 37 megawatt (MW). An example of a Dutch company exporting hydropower-based irrigation solutions is aQysta (see Box 19).

Box 19 – aQysta (© aQysta)

aQysta supplies hydro-powered irrigation pumps. The company's ambition is to become the global leader in hydro-powered pumping.

aQysta currently supplies two products. First, the Barsha pump is used in rivers and streams to lift water in order to create access to irrigation. Second, the HyPump is meant for canals to enable the use of drip irrigation, in order to save water without increase in energy costs. aQysta's products do not need any fuel or electricity.

So far, about 100 aQysta pumps are running in 12 countries worldwide, such as Nepal, Indonesia, Spain, Turkey and Zambia.



Barsha pump of aQysta at work

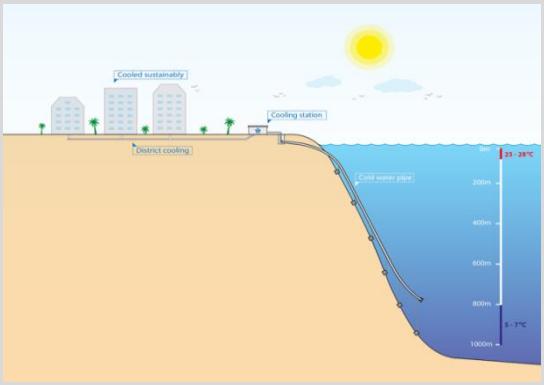
5.3.4 Ocean energy

Hydro-power is not the only form of energy that can be derived from water. The Dutch company Bluerise uses a completely different technology (see Box 20).

Box 20 – Bluerise (© Bluerise)

Bluerise provides cooling systems, known as Seawater District Cooling (SDC) or Seawater Air-Conditioning (SWAC). By pumping ice-cold water (4-6°C) from about 1,000 meter depth, their systems cools buildings like houses, hotels, data centres, airports and greenhouses in close proximity to each other.

According to the company, SDC is 10 times more efficient than the power-hungry conventional chiller systems. It saves 90% of the energy used for cooling. This translates into cost savings that can go up to more than 60%.



Concept of Seawater District Cooling

5.3.5 Blue energy

Last but not least, renewable energy can also be derived from the difference in salt-content between fresh and salt water.[16] A Dutch company working on technology in this area is REDstack (see Box 22).

Box 22 – REDstack (© REDstack)

REDstack is a Dutch company, founded in 2005. The company has developed a unique technology that derives energy from the difference in salt concentration between two waterflows, e.g. fresh and salt water. This technology is called Reverse ElectroDialysis (RED) or 'Blue Energy'.

Places were rivers empty into the sea are the most suitable locations for the application of RED due to the natural abundance of both feed waters. A fraction of the fresh water is combined with sea water in a membrane pile, or RED stack, to which the company also owes its name: REDstack. Other favourable business applications of the technology are: (1) energy production using industrial waterflows with different salt contents, (2) energy reduction in desalination processes and last but not least (3) storage of energy in the Salinity Gradient.

The company runs a pilot plant at the famous Dutch Afsluitdijk, which was officially opened by the Dutch King Willem-Alexander in November 2014. REDstack was appointed as National Icon in 2016. The company has advanced plans to scale up to a demo-pilot in 2020 on their way to commercialize the technology.



REDstack at the Afsluitdijk

[16] The production of energy out of the difference between salt and fresh water is based on the principle that salts like sodium chloride (NaCl) dissolve in water into positively charged sodium ions (Na+) and negatively charged chloride ions (Cl-). Ion-exchange membranes can be placed in between fresh and salt water in order to control the mixing of these positively and negatively charged ions between the two solutions in such a way that a current will start to flow.

6. Business Opportunities

The Moroccan energy market has been growing exponentially since 2009 and is progressively opening up to private investment, particularly in the field of renewable energy and energy efficiency. This chapter aims to give an initial insight into the business opportunities in entering the Moroccan energy market and provides some useful tips to guide interested stakeholders in making their own in-depth market research. These insights are provided mainly from the perspective of Dutch small- and medium-sized enterprises operating in the renewable energy and energy efficiency sectors. This study does not claim to provide an exhaustive description of all the different facets of market entry and is no substitute for the kind of detailed research that enterprises carry out themselves. It does, however, give an overall insight and provide relevant contacts qualified to furnish further information, along with useful advice on implementing renewable energy and energy efficiency projects in Morocco.

Due to the nascence of the renewable energy market in Morocco, there are multiple, small and large projects providing interesting business opportunities. However, it is important for the Dutch government to enter into a bilateral agreement with Moroccan state agencies allowing for Dutch companies to benefit from the range of tenders and projects. The Dutch government has not yet entered into an official agreement with regards to renewable energy with a Moroccan state agency, unlike its European neighbours (France, Spain, Portugal, Germany and Italy).

The Netherlands could explore an agreement with SIE, IRESEN or AMEE as a first step towards common projects in the near future. IRESEN is the key partner for entering strategic partnerships, partly due to its representative stakeholder structure and R&D platforms, but especially due to its leadership's ability to forge national and international projects.

The proposition is to enter a Bilateral Technological Collaboration agreement for the promotion, assistance and financing in realising collaborative projects between entities in Morocco and the Netherlands. For example, if a Dutch and Moroccan company want to collaborate on a specific tender opportunity, they are able to enter a Joint Venture with the Moroccan company receiving co-funding from IRESEN and the Dutch company receiving co-funding from a Dutch government (entity). As such, they are able to be more competitive and the Dutch company is more likely to enter the Moroccan market. In Annex 4, an example agreement between IRESEN and the Dutch government is included in this report.

6.1 Priorities for Morocco

Morocco has firmly set its sights on the large-scale development of renewable energy sources. A continued increase in wind and solar power electricity generation capacity is anticipated in the medium term. Moroccan actors also now have a greater understanding of the true potential of energy efficiency. In addition to heightened public awareness about the benefits of energy efficiency improvements, Moroccan experts also report promising prospects in the country's building and construction sectors, and in its rapidly growing industrial sector.

With regards to electricity generation, the implementation of current strategies is almost completely confined to large-scale projects. Conversely, in the field of energy efficiency, the emphasis is on

decentralised solutions (e.g. personalised financial aid granted to industrial enterprises to enable them to modernise their facilities).

All these initiatives are actively encouraged at the highest level of government, with renewable energy and energy efficiency being at the top of the political and economic agenda.

6.2 Potential for Dutch enterprises in the short- and medium-term

Morocco is currently strengthening its economic relations with a number of countries in Africa. ONEE is pursuing this line of action and offering its rural electrification services, expertise and training in sub-Saharan countries. Significantly, Italy is shifting the focus of its foreign economic policy towards Africa. The Italian power company Enel is planning to build renewable energy plants (solar, wind, hydro and geothermal power) with a total capacity of 5,000 MW in South Africa, Uganda, Kenya, Tanzania, Ethiopia and Mozambique.

Traditionally, France has maintained close economic and political relations with West Africa and there are a number of French enterprises, including energy companies, operating in countries in the region. The Dutch renewable energy sector could miss out on the opportunities presented by relatively untapped African energy markets, which will continue to offer enormous potential for some years to come. The conditions could not be more favourable than they are now. With their polictical stability and advanced position with the EU, Morocco and Tunisia are the most qualified countries in the North African region that can serve as an entry point or bridgehead for the exploration of West African energy markets. In contrast to Tunisia, however, Morocco already has structures in place in African countries and European enterprises can make use of these in their activities. Another feature that makes Morocco particularly attractive in this regard is that it follows clear foreign economic policy directions. Enterprises operating in Morocco can also benefit from the networks and recommendations of their Moroccan trading partners in countries in sub-Saharan Africa. In view of its geographical location, Morocco provides enterprises with a springboard to Africa. Table 12 below shows some potential areas of investment for the Dutch private sector.

Table 10: Potential areas for business

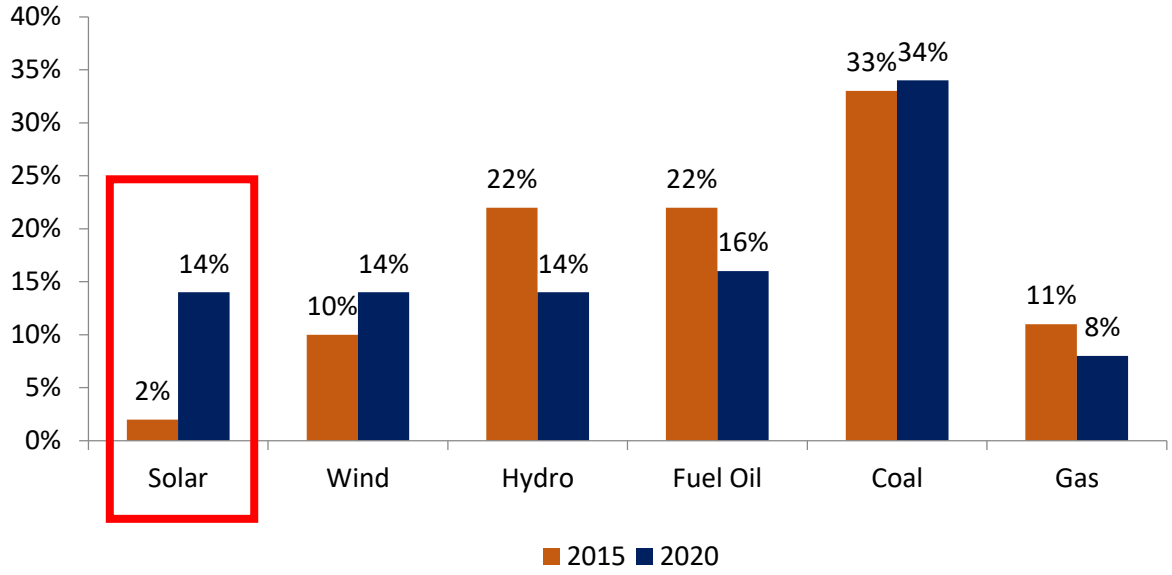
No.	Business area	Description	For
1.	Bidding for lots or components of major projects	The Moroccan energy market is still dominated by major projects. In public tenders (in general, all the announcements of public tenders should be published on the website: https://www.marchespublics.gov.ma and on the concerned institution's website), SMEs have no chance of being awarded contracts, if only because of the huge amounts involved. It is a different story, however, when it comes to subcontracts: the contract for the CSP plant in Ouarzazate (NOOR I) was awarded to the ACWA Power consortium, but, for example, German companies won around a third of the subcontracts awarded by ACWA Power.	SMEs, OEMs, Specialised technology companies
2.	Consultancy and advisory Services	A high proportion of public and private sector actors in Morocco are not sufficiently familiar with current standards, regulations and the latest technologies in renewable energy. There is a shortage in capacity and knowledge, both in the	Services providers and Knowledge institutions

No.	Business area	Description	For
		public and private sector, in this field. Advisory services provided by European research and consulting firms are, therefore, highly appreciated and in great demand. Dutch firms could seize this opportunity to provide: Project management; Project quality assurance (tenders, design, implementation); Studies for public and private-sector institutions; Environmental impact assessments; Energy audits and energy efficiency consultancy; Technical planning; Site supervision; and Training activities.	
3.	Solar-powered pumps	With farming being such an important activity in Morocco, there is potential for solar pumps. The agricultural sector is highly reliant on irrigation and the country needs, above all, decentralised solutions. In 2013, the Moroccan Government announced the start of a programme to promote solar pumps in agriculture which will subsidise the purchase or installation of 10,000 pumps by 2020. The implementation of this programme should boost demand for solar pumps in the agricultural sector. There is also a potential market in industry and households with wells.	OEMs
4.	Process heat	Process heat generation solutions for industry, agriculture, hotel and restaurant industries constitute a potential market that can be immediately tapped, even under the legal framework as it currently stands.	Service companies, Installation firms, OEMs
5.	Photovoltaic electricity generation	Self-generation of electricity is a viable alternative for industrial enterprises that consume large amounts of electricity. Given the current tariff arrangements operated by the ONEE, this solution is advantageous in terms of cost, particularly for large consumers and those who require large amounts of electricity at peak times. In the hotel and restaurant industry, photovoltaic electricity generation can also be an important factor in enhancing brand image.	OEMs, Traders
6.	Energy efficient public lighting	Public lighting in Morocco is the responsibility of the commune authorities, which spend a significant proportion of their budgets on energy bills. They are, therefore, very interested in energy-efficient solutions. Under projects financed by the SIE, the first steps have been taken towards renovating the public lighting system.	OEMs, Traders
7.	Cool chain solutions	Another area with potential is cooling solutions for the storage and transportation of agricultural produce.	OEMs, Traders

6.3 Solar PV and CSP in Morocco

With abundant solar potential of about 2,600 kWh/m^2/year and a geostrategic position at the heart of an energy crossroads, the future of Morocco's solar energy sector is promising. For solar projects, MASEN not only acts as the offtaker but also takes a minority equity stake and provides debt financing for the IPPs through multilateral agency funds borrowed by the Moroccan government. This multiplicity of roles serves not only to secure Morocco's interests in the project, but also to

ensure that project developers, often private foreign firms, secure post-tender financing to build the projects[17]. Morocco's plan, as is shown in Figure 21 below, is very ambitious, with the target of developing 2,000 MW of solar capacity by 2020, including solar, PV and CSP. CSP technology in Morocco's case will focus sunlight to heat fluid used to propel turbines, which will generate electicity.



Source: MASEN

Figure 22: Installed Capacity 2015 vs Projected installed capacity 2020

Several projects and incentives have been developed to catalyse investments and development of the Solar PV and CSP sectors in Morocco for foreign and local private companies. The projected installed capacity of 2000 MW by 2020 will be achieved through IPP (MASEN as purchaser and partner as we described previously) and EPC contracts. Table 13 below shows various projects to be tendered in the coming 2 to 3 years.

Table 11: Projects to be tendered

No.	Project under preparation for tendering (ONEE as owner)	PV farm capacity (MWp)
1.	**NOOR-TAFILALT project**	75-100 MWp
2.	**NOOR-ATLAS Project**	200 MWp
3.	**NOOR-ARGANA Project**	100-125 MWp

Given the fact that solar PV and CSP are still not mature sectors in Morocco and the government has high asiprations and plans for the sector, it is evident that there are opportunities from the production, supply, management and maintainance of all the new systems being developed. Private companies in collaboration with the government in PPPs are charged with developing these systems. In addition to the projects listed above there are a number of other opportunities, as indicated below.

[17]"Masens's NOOR solar energy project," Norton Rose Fulbright, June 23, 2016
https://www.insideafricalaw.com/publications/masen-s-noor-solar-energy-projects

- The Moroccan market of solar water heaters (PROMASOL) programme for the mechanism of 440,000 m^2 of solar thermal collectors in 2012 and 1.7 million m^2 in 2020. This programme may be interesting for leading Dutch companies in solar water heating and HVAC solutions.
- The national solar pumping programme is a partnership between the ministries of energy and Agriculture and the Credit Agricole Group. This programme is designed to allow small- and medium-sized farmers to equip themselves, with the help of a grant from the Fund of development of energy (FDE), with water pumps that use electricity generated from solar panels.
- The national programme of generalisation of the low-energy consumption bulbs aims to install more than 5 million energy-efficient bulbs.
- Low / medium voltage hybrid energy systems (PV and Biomass sources) also have big business potential for Dutch companies, since the new renewable energy law is opening the electricity grid up to renewable sources in the medium- and low-voltage segment.
- There is also opportunity in training, knowledge transfer and capacity building for the ONEE personnel required to regulate and maintain all the energy produced from renewable sources.

The emphasis is on investments and business opportunities in the solar photovoltaic and CSP sectors, as the Dutch private sector has a strong track record in the technology and innovation suitable for these sectors.

6.4 Challenges for international enterprises

In spite of the great potential offered by Morocco in the field of renewable energy and energy efficiency, there are a number of specific obstacles that European enterprises will need to overcome. There is the language barrier: a basic knowledge of English is not enough to gain entry into this market. While English is gaining ground in some spheres, French remains the language of business. A good command of French is, therefore, essential. There are also some stark differences between Morocco and European countries in terms of culture and in the way they do business. Personal relations and meetings play a very important part, requiring frequent stays in the country. It is often not at official meetings that important decisions are discussed, but rather in a café or restaurant. Other obstacles pointed out by the experts consulted include:

- Lack of local experience in renewable energy and energy efficiency – these fields are new to Morocco and considerable groundwork remains to be done;
- The predominance of major projects, which only benefit SMEs in a limited or indirect way;
- Absence of provisions in Moroccan legislation concerning access by private electricity producers to the low-voltage network, thereby preventing enterprises from entering this very attractive market;
- Automation in public administration is still in its early stages and there's a lack of direction and transparency; and
- The generally compulsory requirement to post a bid bond, even when bidding for small contracts.

6.5 Recommendations

The following practical recommendations were made in the report presented by PAREMA (Moroccan-German Energy Partnership) for enterprises interested in moving into Morocco's renewable energy sector. They remain valid for Dutch entrepreneurs as well.

- Now is the time for companies to position themselves, with a physical presence, in anticipation of imminent developments in the African and Moroccan energy markets. Successful market entry requires forward planning. It is, therefore, advisable to start laying the groundwork now, getting the necessary structures and networks in place.
- There is no substitute for presence (feet) on the ground and personal contacts. You should assume that your competitors are more likely to get on a plane and go to Morocco than to email their Moroccan clients and trading partners. The Moroccan business culture is largely based on personal relations. The stronger your presence in the country, the better your chances of establishing important contacts and gleaning vital information. The ideal solution is to have a person permanently stationed in the country. If this is not feasible, people from your company should visit Morocco as often as possible and prolong their stays from time to time.
- Successful entry into the Moroccan market will take some time. Do not expect immediate results; you will have to invest considerable time and effort, especially at the beginning. It is particularly important to build and maintain personal relations and networks.
- Networking! If you do not have the necessary capacities or are unable to mobilise them, your first stop should be the Moroccan industry associations (CGEM) or MASEN which can also offer networking services. Another solution is to have your French dealer or branch represent you in the Moroccan market. This approach has worked well, thanks to the cultural and economic proximity of France and Morocco. However, if you are planning a lasting strategic commitment in Morocco (and Africa), it is preferable in the long term to get your own capacities in place.
- Contact financial institutions, such as the MORSEFF, local private banks or the SIE, register your company with them and have its details included in the relevant databases. This will increase your visibility and your chances of being noticed by Moroccan actors. You will also be kept informed of any new developments. If you are planning a visit to Morocco, you can also contact the cooperation services of the Netherlands' embassy in Morocco.
- All the experts consulted agreed that the Moroccan market is still too small to justify a company establishing its own production facilities. This approach could, however, prove to be profitable and a viable option for the African market as a whole.
- Use the whole-life costing argument to your advantage! As mentioned above, European products are relatively expensive for Moroccan customers to purchase. It is advisable to present the life-cycle cost calculation to them and explain in detail why your product is a profitable investment, even if the purchase price is higher.
- According to some local stakeholders, tenders submitted by European companies (e.g. in response to invitations to tender) seem more complicated and expensive than those of their competitors on the Moroccan market. They sometimes include services that are not necessary or have not been requested by the client; indeed, the fact that competitors do not include such services makes their quotations more attractive. It is, therefore, advisable to reduce the complexity of written tenders, including only what is specified in the invitation to tender (keeping the cost down) and accentuating the selling points. It is always better to wait before offering additional services.
- Local stakeholders recommend setting up after-sales services operated by your own in-country personnel or in cooperation with partners. This will not only be advantageous in terms of cost,

but will also allow you to meet a major need of Moroccan customers: proximity. It will bring you nearer to your customers and enable you to respond promptly and flexibly to their requests. If you have to fly people to Morocco to carry out maintenance and assistance operations, you will be much more expensive and less responsive to needs than some of your competitors. On the Moroccan side, there have been complaints that the language barrier is too big an obstacle when maintenance and assistance operations are carried out by personnel sent from abroad, e.g. The Netherlands.

- This may seem obvious and somewhat trivial, but, in practice, it is important: your information brochures and websites must also be in French! In Morocco, information provided in English will, even at the best of times, only open the door to a small circle of clients and partners.
- In order to gain a foothold in the Moroccan market, you should also harness social networks, particularly LinkedIn, Facebook and Twitter.

Annex

Annex 1: References

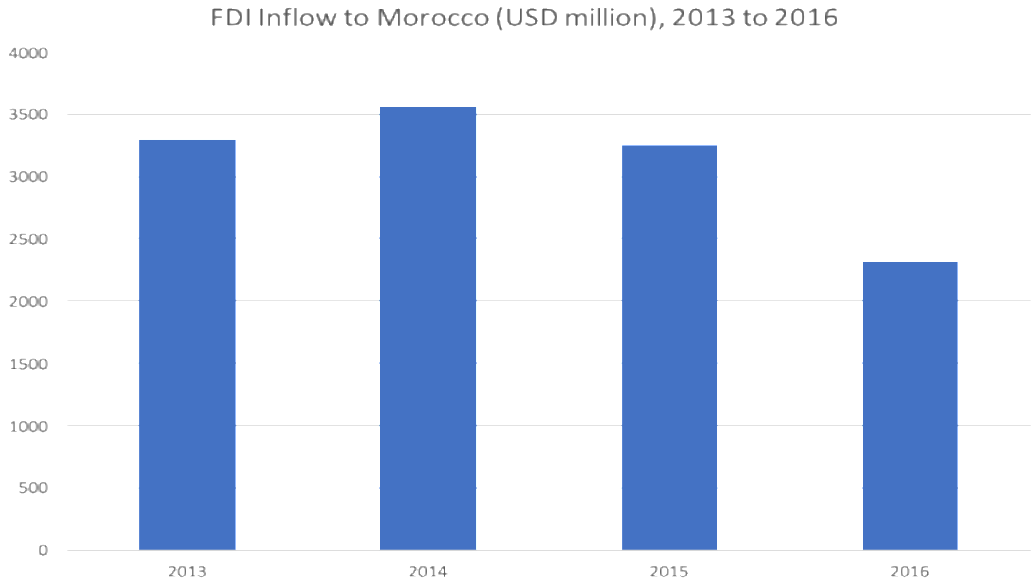
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Annex 2: List of Institutions Interviewed

No	Name	Location
1	IRESEN	Rabat
2	MASEN	Rabat
3	AMEE	Rabat
4	CGEM	Casablanca
5	TAQA	Casablanca
6	Ministry of Energy	Rabat
7	Ministry of Industry	Rabat
8	SIE	Rabat
9	Nareva Holding	Rabat
10	FENELEC	Casablanca
11	CMPP	Casablanca

Annex 3: Figures

Exhibit 1: Selected FDI Statistics



Source: UNCTAD, World Investment Report 2017

Exhibit 2: Energy Demand in 2016

Origin	demand in GWh (2016)	Evolution 2016 / 2015
ONEE thermal	8 278,526	8,6
Hydraulic	1 255,718	-33,4
Pumping energy transfer station	406,510	2,6
ONEE wind	621,005	6,4
Wind law 13-09	906,316	40,6
Jorf lasfar Electrical Company (JLEC)	14 764,712	-1,1
Electrical Energy of Tahaddart (EET)	2 609,057	4,7
Compagnie Eolienne du Détroit (CED) + TARFAYA	1 330,935	15,6
Contributions of the third	123,655	107,1
Solar	401,509	6 988,8
Import	5 288,804	2,9
Export	-134,701	-18,2
Auxiliaries and pumping *	-579,359	22,1
Wind via client Network	141,840	1,4
Global called energy	35 414,527	2,9

Annex 4: Sample Agreement between IRESEN and EU country

1.01 Les Parties sont d'accord pour poursuivre leurs objectifs par la promotion, l`assistance et le financement de la réalisation de projets communs de coopération technologique entre des entités du Maroc et de l'XXXXX, dans les secteurs d'intérêt commun sans échange de fonds entre les parties et soumis aux règles et réglementation de chaque pays pour le partage correspondant des dits projets.

1.02 Les Parties sont également d'accord pour faciliter aux entités collaboratrices le contact avec autres organisations et institutions XXX et marocaines qui peuvent aider les Parties à fournir des mécanismes pour assister les entreprises et institutions de recherche dans chaque pays à accéder aux services d'innovation qui ne sont pas disponibles autrement.

1.03 Par ailleurs, les deux Parties sont d'accord pour encourager et promouvoir à travers des actions spécifiques pour :

(a) Identifier les entités innovatrices dans le pays de chaque Partie qui pourraient établir alliances de collaboration technologique et réaliser des projets communs;

(b) Assister les entités du Maroc et de l'XXXXX pour le développement de collaborations technologiques et projets communs.

2.- Activités de collaboration potentielles

2.01 Les Parties peuvent collaborer à travers toutes ou quelques-unes des activités suivantes:

(a) Faciliter des alliances de collaboration technologique et projets communs entre entités du Maroc et de l'XXXXX à travers l'organisation de rencontres.

(b) Etablir un Programme de Coopération Technologique Bilatérale XXXX-Marocain, à priori appelé «INNO-XXXMAROC ENERGY» (Maroc-XXXXX Innovation Programme on Energy Technologies).

(c) Echange d'information concernant leurs activités de collaboration pour permettre aux deux Parties l'évaluation de leurs capacités dans les relations avec les collectivités clientes respectives ; et

(d) Autres moyens de collaboration, coopération et initiatives conjointes qui permettraient d'aider les entités de chaque Partie pour mettre en place des partenariats durables basés sur la technologie.

2.02 Autres formes de collaboration, en plus des activités décrites ci-dessus et dans le Section 1 peuvent être déterminées à travers des consultations dans le cadre du comité de pilotage IRESEN/ XXXX décrit dans le section 4.

3.- Programme de Coopération Technologique Bilatéral

Dans le but d'établir un Programme de Coopération Technologique Bilatéral tel qu'il est indiqué dans le Section 2.1 (b) ci-dessus, les principes basiques suivants seront appliqués :

3.01 L'objectif du Programme Bilatéral est la réalisation par les entités de projets de coopération technologique communs, et pour ce faire chaque Partie devra financer les entités de son pays dans la mesure où elles sont conformes aux normes et règlementation internes et aux conditions générales de cet Accord. Les deux Parties réaliseront dans un délai non supérieur à 3 mois l'évaluation technique et financière nécessaire pour l'éligibilité des projets technologiques communs. Au terme du procès, les deux Parties s'engageront, ou rejetteront, au financement du projet, à moins que les partenaires décident de continuer leur coopération par leurs propres moyens financiers.

3.02 Les Parties établiront un Plan de Travail annuel et le détail des activités prévues qui devront être développées, ainsi que les objectifs à atteindre en termes des secteurs concernés et le nombre de projets technologiques à financer à travers le Programme Bilatéral et d'accord aux dispositions établies à la Section 1.

3.03 Les aspects techniques et de gestion basiques du dit Programme Bilatéral son réglementés sur l'Annexe I de cet Accord de Coopération entre l´IRESEN et le XXXX.

Annex 5 : Law 13-09

Increase of the threshold from 12 to 30 MW for hydro-power	The law No 13-09 excluded from its projects whose power was greater than 12 MW, which constituted a barrier to operate the maximum threshold offered by morphological and hydrological characteristics of the production sites. This threshold will now be increased to 30 MW, resulting in an amendment of the first article of the Law No 13-09.
Sale of the excess production	Possibility of selling the excess electricity production from renewable sources as part of the facilities connected to the national network of high voltage (HV) and very High Voltage (VHV) and of medium voltage and low voltage network to ONEE or to distribution system operators The operator shall not sell more than 20% as a surplus of the annual production. The commercial terms and conditions of the surplus's redemption are set by regulation
Opening of the law voltage renewable energy market	The opening of access to law voltage distribution network will take part in the law 13-09 (5th Article), previously confined to the HT, THT and MT. This would allow the development of industrial sector of small and medium facilities, including photovoltaics and creating jobs in the renewable energy sector. The access to the law voltage electric network will be subordinated to "the terms and conditions set by regulation."
Taking into account the opinion of the Basin Agency in the authorization process	Under the law 13-09, the granting of the authorization for any project of electrical production facilities from hydraulic power source was submitted to only the technical advice of the national transportation network manager. With the amending project, it has also to be submitted to the hydraulic basin concerned advice.

Annex 6 : SWOT Analysis

Annex 6.1: SWOT analysis of wind power

Strengths

- good wind conditions
- established technology
- micro power stations can be used in places not connected to the power grid (Hybrid systems)
- high interest among investors
- funding support, including green certificates
- well accepted by the local population (road access)

Weaknesses

- complicated and time-consuming procedure to obtain a construction permit
- high investment costs
- impact on the landscape
- potential threat to fauna
- difficult to forcast
- very competitve market

Opportunities

- technological progress increasing the efficiency of wind power installations
- development of energy storage technologies

Threats

- difficulties with connection to the power grid

Annex 6.2: SWOT analysis of hydropower

Strengths

- cheaper energy than from conventional sources
- well-controlled technology
- increased retention of surface water and ground water
- Micro hydropower stations can be constructed in many places, even on small water courses

Weaknesses

- it is often necessary to put weirs on the river
- negative impact on the fish population
- unable to operate during a long-term drought

Opportunities

- possibility to use water bodies for tourism and recreation
- development of fishing
- possibility of using bodies of water for tourism and recreation purposes
- clear legal regulations

Threats

- limited interest from investors

Annex 6.3: SWOT analysis of biomass combustion and co-combustion

Strengths
- great agricultural potential
- known and simple to implement technology

Weaknesses
- farmers have limited knowledge about energy crops
- availability of biomass

Opportunities
- possibility to utilize waste types of biomass
- public disposals potential

Threats
- variable prices of biomass
- difficulties ensuring stable supply

Annex 6.4: SWOT analysis of biogas production

Strengths
- well-developed agriculture
- significant experience of technology
- waste deodorization treatment and disposal technology
- co-generation technology is most often applied
- generated power can be used on site or transferred
- increase in employment (a high proportion of local companies participating in the construction of installations)
- increased crop yield due to use of post-fermentation pulp as a fertilizer

Weaknesses
- lack of previous experience in Morocco
- long investment process
- problems with utilizing heat

Opportunities
- fast development of biogas technology
- use of biogas as a fuel
- utilization of heat generated from biogas combustion to heat greenhouse crops

Threats
- variable prices of agricultural substrates
- unpredictable supply of feedstock in agricultural biogas plants
- availability of biomass due to no compulsory waste segregation for waste collection

Annex 6.5: SWOT analysis of solar energy

Strengths
- High solar irradiation of the region
- reduced heating costs
- usable in locations not connected to the power grid (photovoltaics)
- high public support
- low operating costs of installations
- reliable, low maintenance
- can be combined with other installations, e.g. a heat pump

Weaknesses
- high cost for photovoltaic installations in particular (with batteries)
- long wait for break-even point
- seasonal disparity between solar energy in spring-summer and autumn-winter

Opportunities
- fast technological progress improving efficiency and reducing the cost of solar installations
- high demand for solar installations

Threats
- no support for micro sources and small sources of energy (legislation is still slow on commercial terms)

Annex 7 : Draft Law No. 48 – 15

Draft law No. 48-15 relating to the regulation of the electricity sector[18]

The electricity market in Morocco is partially open to competition for the production and commercialisation of electrical energy from renewable energy sources for customers connected to VHV / HV / MV, in accordance with the law 13-09 renewable energy.

Indeed, the new legislative framework for the renewable energy sector offers the possibility to private operators to develop electricity generation projects from renewable sources and to sell electricity to a consumer of their choice with a guaranteed right of access to the national power grids within the limit of available technical capacity of networks. It also offers the ability to export electricity from renewable sources and private developers to achieve, for their own use, direct transmission lines, when the capacity of the national electricity transmission network and interconnections are insufficient.

To accompany the profound changes occurred in the renewable energy sector, it is planned to

[18] http://www.mem.gov.ma/SitePages/GrandChantiersEn/DERegulationOfSector.aspx

establish a national regulatory authority independent from energy operators for the definition of tariffs and conditions for access to the networks and interconnections.

Draft law No. 48-15 relating to the regulation of the electricity sector has been developed in consultation with all stakeholders in the power sector and based on the national scheme of the electricity sector regulation adopted in 2012 by the operators and relevant government departments, which has been developed on regulatory principles as follows:

- Continuing public service principles guaranteeing everyone the supply of electricity throughout the territory;
- Creation of an entity dedicated to the management of the national transmission electricity network in ONEE;
- Creation of an independent national regulatory authority for the power sector.

Under the new law 48-15, the National Authority for Electricity Regulation, which will ensure the well-functioning of the free market for electricity generated from renewable sources and will regulate the access of self-producers to the national electricity transmission grid under the opening and liberalisation in accordance with the law 13-09 renewable energy. This free market, where all electricity supplier which produce electricity from renewable sources may, in compliance with current regulations, commercialise in the electrical energy market in Morocco and abroad, may be extended as provided by laws and regulations to be adopted for this purpose.

First of all, this creation will allow to give a strong signal of modernisation of the sector and independence from the operators of the electricity sector and secondly, to support future changes that will occur in the electricity sector, in notably the deepening of the opening of the electricity market and changes that will occur in the different activities related to the power sector.

The draft law No. 48-15 relating to the regulation of the electricity sector was adopted by the Council of Government on September 17 2015.

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