Tunisia: Solar Investment Opportunities

Emerging Markets Task Force Report

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الغرفة النقابية الوطنية لتركيب وصيانة المعدات الفوطاضوئية
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UTICA

SolarPower Europe

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Project information: TThe SolarPower Europe Emerging Markets Task Force was launched in March 2018 and, since then, has become an active working group of more than 120 experts from more than 60 companies. The objective of the Task Force is to identify business and cooperation opportunities and thereby contribute to the energy transition in emerging markets outside Europe.

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"After a few years of strong commitment and support from the government, the Plan Solaire Tunisien is becoming a reality at a large scale, making Tunisia a strong renewable player in North Africa. The country managed to attract the best tariffs in all of Africa from prime global players on its concession auctions. The focus is now on successfully developing a market of mid-size projects to attract stakeholders (fund providers, developers, EPC contractors, etc.) from all over the world"

Antoine Poussard
Finergreen

SolarPower Europe would like to thank the members of its Emerging Markets Task Force that contributed to this report including:

Sponsor Members:

FOREWORD

BY STEFANO MANTELLASSI, Vice-President Energy Solutions ENI SpA and Chair of SolarPower Europe's Emerging Markets Task Force, and ANTOINE POUSSARD , Managing Partner MENA region, Finergreen.

SolarPower Europe established its Emerging Markets Task Force in March 2018 to identify business and cooperation opportunities in emerging markets outside of Europe, with the aim of contributing to energy transitions around the world. In its one and a half years of existence, the Emerging Markets Task Force has become an active working group with more than 120 experts from over 60 companies, working on a series of reports presenting solar investment opportunities in new and emerging markets worldwide.

The Task Force operates through a series of physical and virtual meetings, organising visits to the selected markets as well as facilitating speaking opportunities at conferences. Member companies also are involved in relevant initiatives such as the EU-Africa Sustainable Energy Investment Platform, the renewAfrica initiative, and IRENA's Coalition for Action. Moreover, Task Force members exchange and cooperate with international stakeholders such as the European Commission, the International Renewable Energy Agency (IRENA), the International Solar Alliance, and GET.invest, as well as key stakeholders such as national industry associations from various countries to shape the global energy transition.

With this report we are proud to present our findings on solar investment opportunities in Tunisia. The report provides a snapshot of Tunisia's business environment, major macroeconomic trends, and analyses issues related to the country's credit and political risk. Moreover, it characterises the country's energy context, relevant stakeholders, as well as regulatory framework for investment. The research finds that Tunisia has strong solar energy potential, which the government increasingly harnesses. To effectively do so, the country's financial, technical, and administrative environment could still be improved. Therefore, the report concludes with some recommendations for investors, policymakers, development finance institutions, and local private stakeholders to take into consideration.

The Tunisia report is the seventh in a series of SolarPower Europe market reports. Previous reports cover Mozambique, Senegal, Ivory Coast, Myanmar, Kazakhstan, and India. All reports can be downloaded from www.solarpowereurope.org, free of charge.

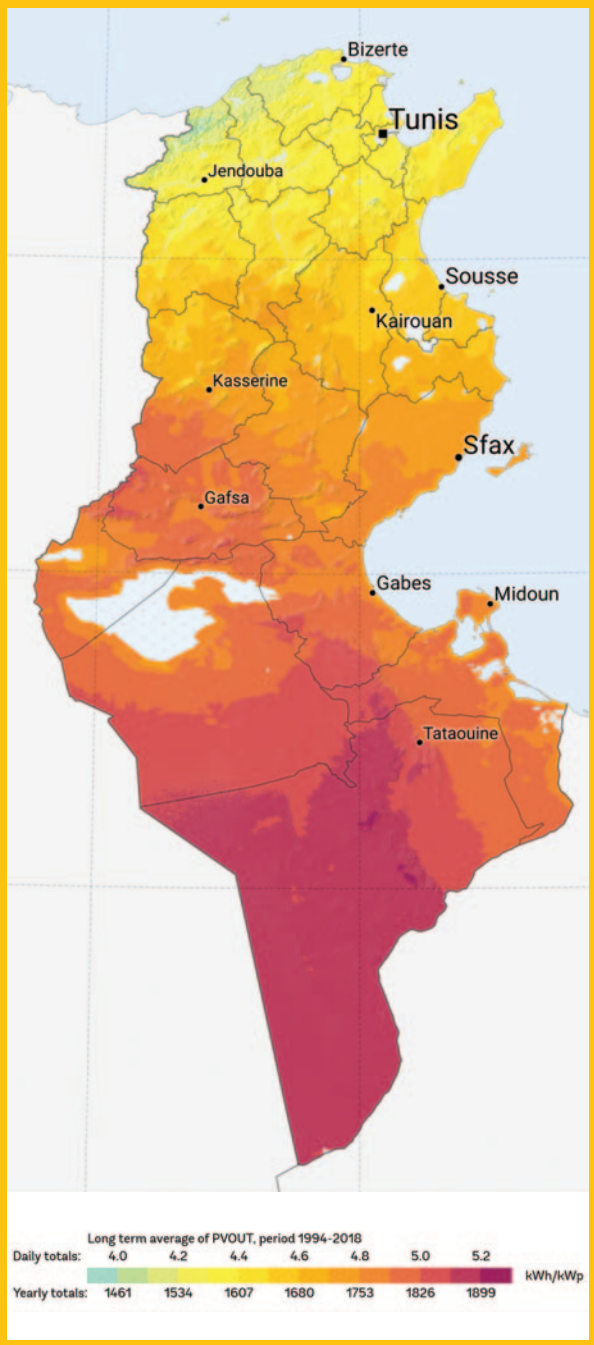
If you want to be part of our activities and discover new solar business opportunities, join SolarPower Europe's Emerging Markets Task Force.

STEFANO MANTELLASSI
Vice-President Energy Solutions, ENI SpA.

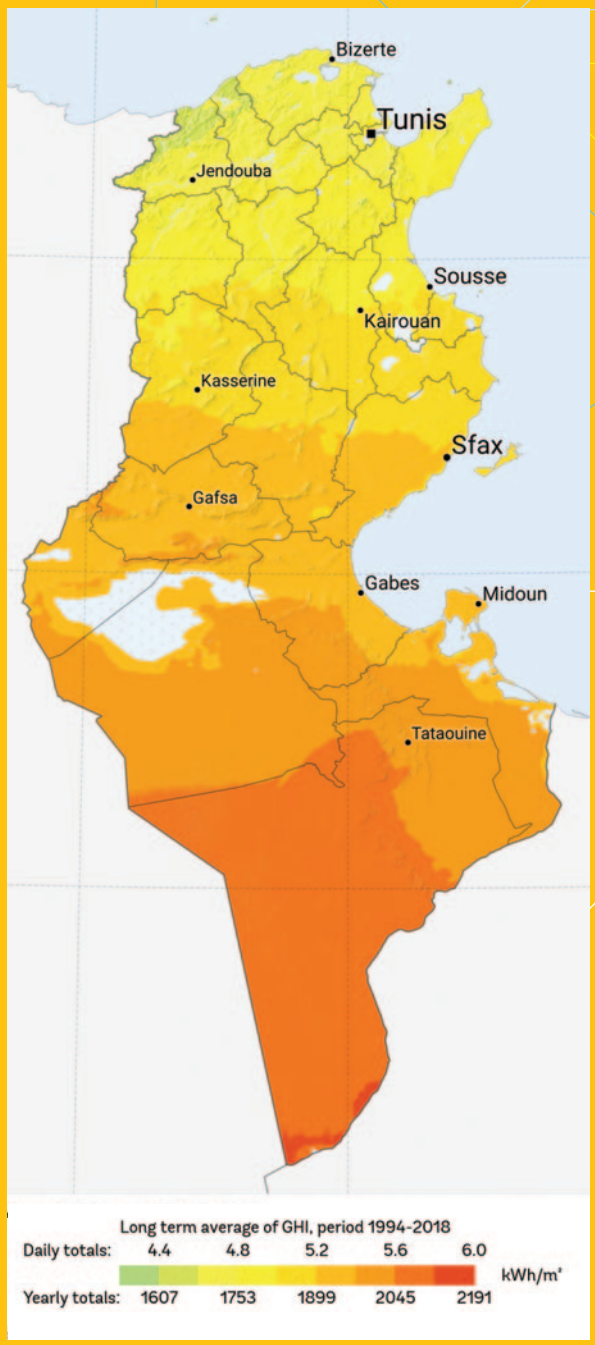
Chair of the SolarPower Europe Emerging Markets Task Force.

ANTOINE POUSSARD
Managing Partner MENA region, Finergreen.

PHOTOVOLTAIC POWER POTENTIAL
TUNISIA



GLOBAL HORIZONTAL IRRADIATION
TUNISIA



SOURCE: 2019 The World Bank, Source: Global Solar Atlas 2.0, Solar resource data: Solargis.

1. CONTEXT

WORK STREAM

TUNISIA

OFFICIAL LANGUAGE	Arabic
CAPITAL	Tunis
CURRENCY	Tunisian Dinar (TND)
SURFACE	162,155 km^2
POPULATION (2018)	11,565,204
POPULATION DENSITY (2018)	74. 23 (per km^2 of land)
GDP (2018)	USD 39.86 billion
MIDDLE EAST AND NORTH AFRICA GDP GROWTH AVERAGE (2019)	2.4%
GDP GROWTH (2018)	2.5%
LITERACY RATE (2014)	79% of people aged 15 and above
INDIVIDUALS USING INTERNET (2017)	55.5% of population
MOBILE PHONE CONNECTIONS (2017)	124 subscriptions per 100

SOURCE: World Bank, 2019.

ENERGY GEOGRAPHY

The Tunisian territory offers attractive energy resources. In addition to its potential for solar and wind, the country possesses natural reserves of oil and gas. The country has been able to rely mostly on its natural oil and gas resources to face its energy demand. However, over the last decade, the energy production of Tunisia has strongly decreased, while the demand for energy within the country has continued to increase. Indeed, during the 2010–2018 period, the demand of primary energy increased by around 15%, while the production of energy decreased by around 42%, leading the country – which was almost energy independent a decade ago (95% of energy independence in 2010) – to be now mostly dependent on its neighbouring countries (e.g. Algeria) for its energy needs (48% of energy independence in 2018). This energy deficit, coupled with the TND depreciation, has had a significant impact on Tunisia's current account balance. The Tunisian energy deficit today is 13 times what it was in 2010, increasing from EUR 154 million to EUR 1,970 million.[1] Today, Tunisia's energy deficit is responsible for 32% of the Tunisian commercial deficit.

In this context, Tunisia's strong solar energy potential, which is being increasingly exploited since 2009, is particularly crucial. The revision of the Tunisian Solar Plan (*Plan Solaire Tunisien*, PST) adopted in 2012 after its original launch in 2009 is a clear indication of this.

Tunisia offers abundant solar resources with an average global horizontal irradiation of around 1,850 kWh/m^2/year. The overall horizontal solar irradiation exceeds 1,900 kWh/m^2/year in the southern half of the country and is more than 2,045 kWh/m^2/year in the region of Tataouine. Tunisia therefore has significant potential for photovoltaic projects and thermal technologies. In a context of declining prices for photovoltaic panels and highly volatile oil prices, solar energy appears to be an attractive solution and represents a huge development opportunity.

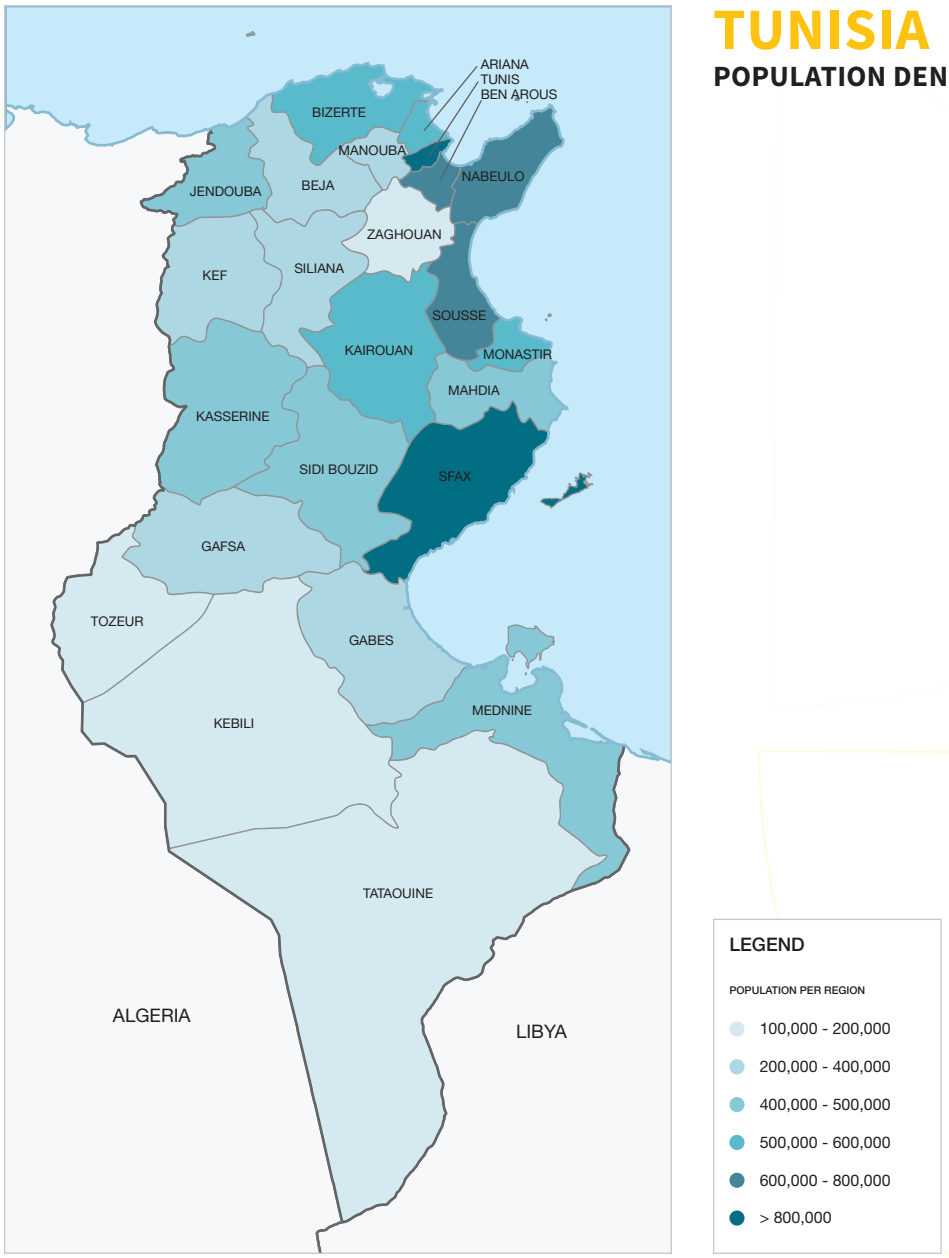
DEMOGRAPHICS

Tunisia has a population of almost 11.6 million inhabitants with a median age of 31.6, the oldest in the region (25.0 for North African countries and 29.6 for the world) (The World Bank, 2019), and with a lower-than-average demographic growth of +1.1% in 2017 (compared to the African average of 2.6%).

1 Using a conversion rate: 1 TND = 0.35 USD, from USD 169 Mn to USD 2.16 Bn.

TUNISIA

POPULATION DENSITY BY REGION



SOURCE: INS, 2014.

Tunisia had a population density rate of 74.23 people/km^2 in 2017. Most of the population lives in urban area (68.6%) but it is growing at an increasingly slower rate (1.6% in 2017 against 3.9% in 1990). In parallel, the urban population is stagnating (+0.2% in 2017). This can be explained by the combined effect of low annual population growth (+1.1%) and the low fertility rate (2.2 births per woman in 2016).

The majority of the population is concentrated along the Mediterranean coast, particularly in the regions of Ben Arous, Nabeul, Sousse, Sfax and Tunis.

MACROECONOMIC CONTEXT

With a GDP of USD 38.73 billion so far in 2019, Tunisia has the lowest GDP in the MENA region and the third lowest GDP per capita after Algeria and Yemen (USD 3.07 thousand for Tunisia, USD 3.02 thousand for Egypt and USD 918.8 for Yemen). However, if compared to other African countries, the GDP per capita of Tunisia is higher, ranking among the ten top countries in Africa. In terms of growth, Tunisia shows promise, with an improving GDP growth rate over the past few years, from 1.2% in 2015 to 2.5% in 2018. It is expected to reach 4.4% in 2024 (IMF, 2019). Though this rate seems relatively modest when compared to other African countries, the current and expected growth levels are positive for the MENA region and put Tunisia among the region's fastest growing countries.

The key sectors of the Tunisian economy are (CIA World Factbook, 2019):

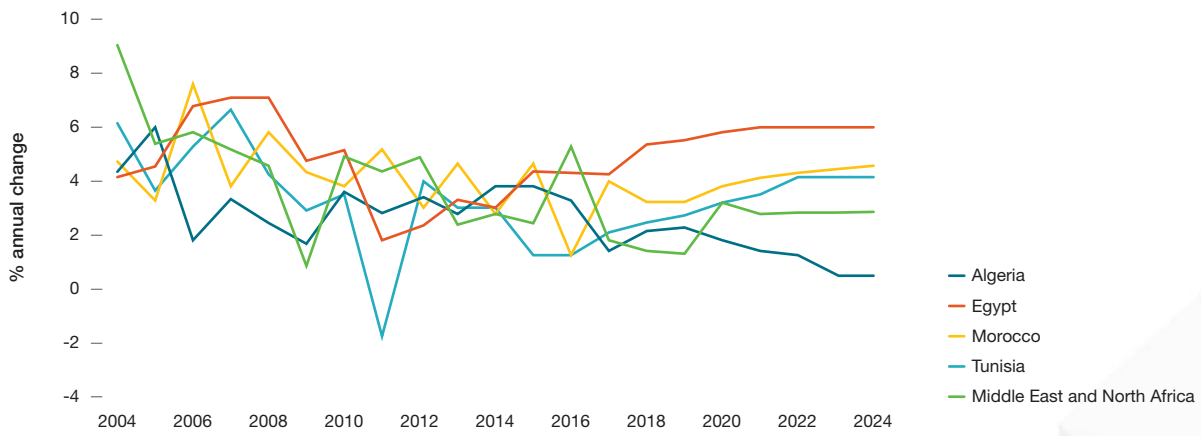
- Agriculture (10.1% of GDP) (2017 est.)
- Industry (26.2% of GDP, mainly textile exports)
- Services (63.8% of GDP, essentially information and communication, technologies and tourism)

Thanks to exceptional harvests and a tourist season returning to 2010 levels (i.e. before the Tunisian revolution of 2011), GDP growth accelerated in the second quarter of 2018, rising to 2.8% from 2.5% in the previous quarter. This increase is allowing Tunisia to reach the growth levels that were foreseen by the IMF in 2018.

Since the Tunisian revolution, however, the country's debt has increased from around 40% of the GDP in 2010 to 70% in 2017. Under the IMF control, Tunisia has undergone reforms that were intended to contain the debt below the 2018 IMF prediction of 72% (IMF, 2018). Nonetheless, public finances deteriorated with the debt ratio increasing sharply to 77% of GDP at the end of 2018 (Moody's, 2019). This, together with an increase of the current account led to a depreciation of the dinar (-60% of its value since 2014), and a historically high inflation rate (more than 7% in 2018).

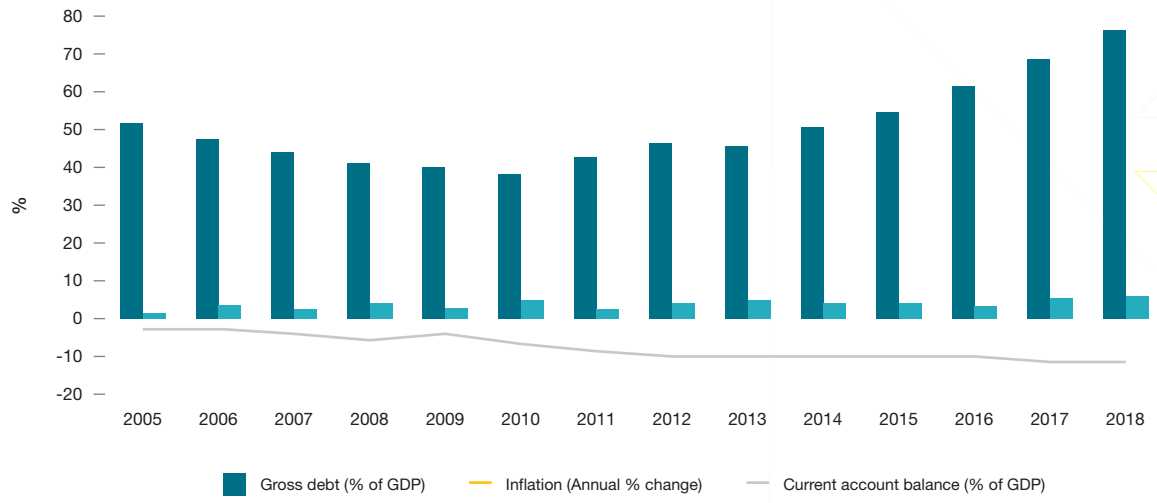
Moreover, unemployment affects more than 15% of the total working population. In particular, the country suffers from high youth unemployment (about 35%), post-secondary school graduates being the most affected (about 30%). These elements negatively impact the economy.

FIGURE 1 GDP GROWTH IN MENA



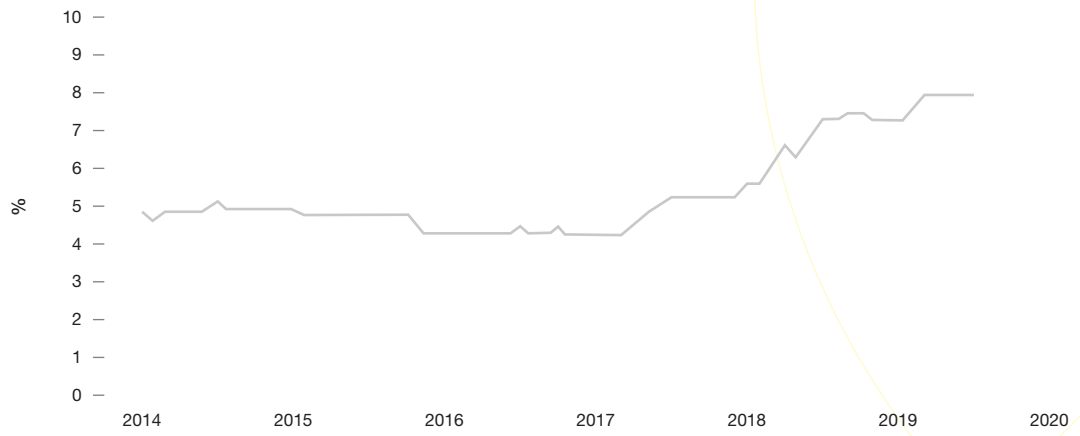
SOURCE: IMF, 2019.

FIGURE 2 ECONOMIC INDICATORS



SOURCE: BTC, 2019.

FIGURE 3 EVOLUTION OF THE AVERAGE MONEY MARKET RATE "TAUX MOYEN DU MARCHÉ MONÉTAIRE", TMM

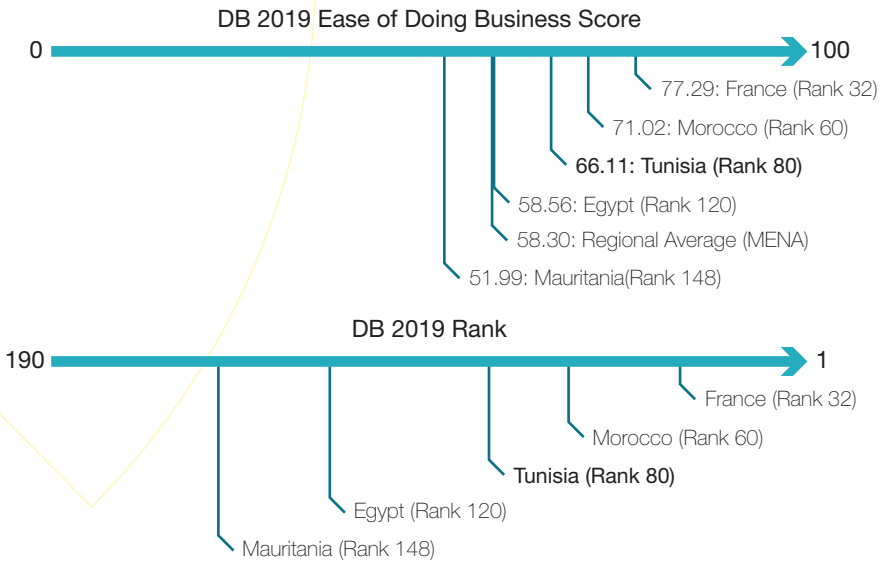


SOURCE: BTC, 2019.

These features of the economy coupled with the political uncertainty due to new government elections have resulted in a significant increase of the average money market rate (*Taux Moyen du marché Monétaire*, TMM) over the past two years. The increase of this base rate mechanically weakens the financing conditions in the country and impacts the bankability of small- to medium-sized local projects, which therefore have been delayed and have to rely on subsidies to become profitable. Other factors also constrain the depth of the financial market in Tunisia, like minimum gearing requirements set by the Tunisian Central Bank (BCT) and back banking facilities, which result in commercial banks being more cautious in funding projects on their own balance sheet. Other factors include: the lack of experience of local banks in financing projects on a non-recourse basis, or in long-term financing, as well as the high volatility of the TND, with limited cross-currency hedging options.

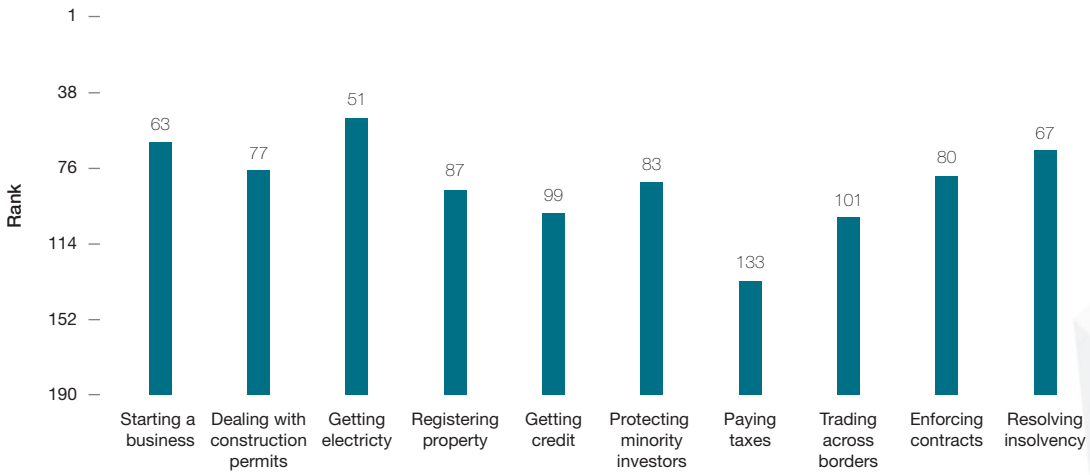
The recovery of the Tunisian economy is primarily driven by tourism, agriculture and manufacturing. Credit rating agencies like Moody's observe the country for signs of stabilisation of fiscal imbalances and foreign exchange reserves, as well as costs of external funding and the implementation of the IMF reform programme to determine the country's outlook (Moody's, 2019).

FIGURE 4 EASE OF DOING BUSINESS IN TUNISIA, 2019



SOURCE: World Bank.
NOTE: The ease of doing business score captures the gap of each economy from the best regulatory performance observed on each of the indicators across all economies in the *Doing Business* sample since 2005. An economy's ease of doing business score is reflected on a scale from 0 to 100, where 0 represents the lowest and 100 represents the best performance. The ease of doing business ranking ranges from 1 to 190.

FIGURE 5 EASE OF DOING BUSINESS - SCORE ON DIFFERENT TOPICS



SOURCE: World Bank Group, 2019.

BUSINESS ENVIRONMENT

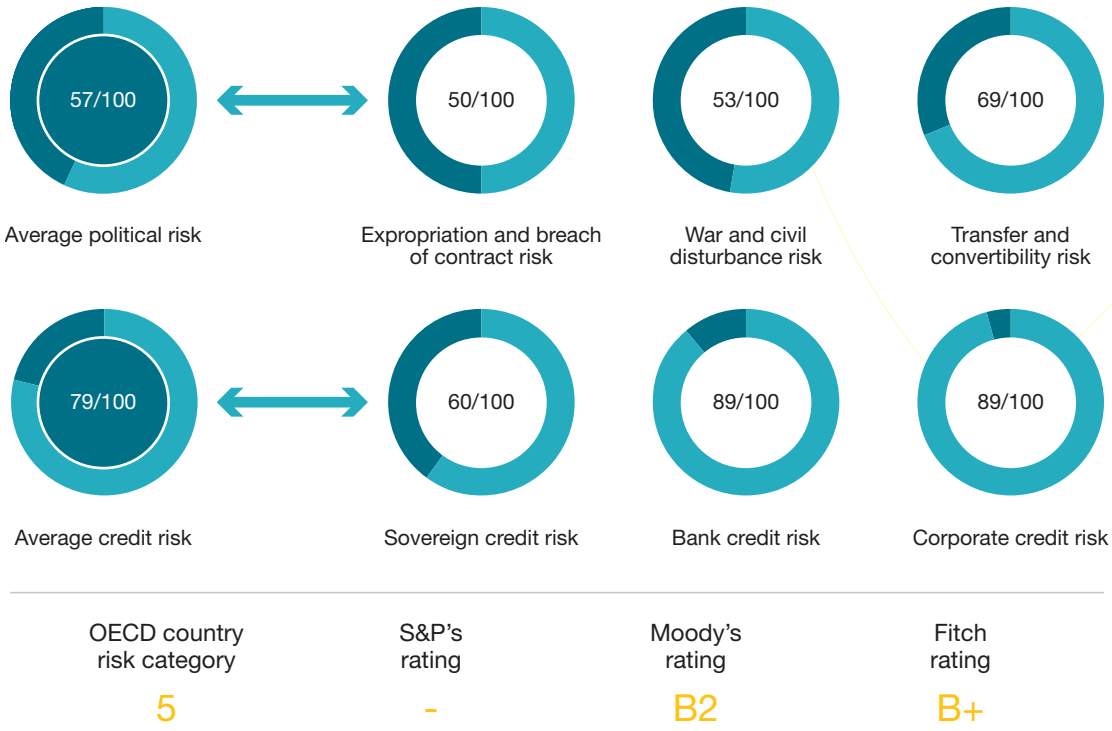
The Doing Business Index is published annually by the World Bank and offers a general picture of the efficiency of the country's economic system. It measures the impact of regulatory and fiscal discipline on business activities and the ease/difficulty of doing business in the country through the analysis of selected criteria such as fiscal discipline, access to credit, international trade, tax, register of property titles, and investor protection.

Holding the 80th place in the *Ease of Doing Business* ranking in 2019, Tunisia is the fifth country within the MENA region and ranks between Oman (78th) and Qatar (83th). In the evaluation of Tunisia's business environment, "Paying Taxes" is the most important barrier for the investors' initiative. The total tax and contribution rate of 60% of the profit in Tunisia is extremely high compared to an average of 32.7% in MENA and Africa and 39.8% in OECD countries.

To improve the business environment, Tunisia has launched the *Plan de Développement* (its national development plan) 2016-2020. This plan includes a new investment regulation that led to the creation of the *Conseil Supérieur de l'Investissement* (High Council for Investment). This body ensures the removal of obstacles and the flexibility of administrative channels for investors. This plan grants tax benefits to foreign investors over 10 years as well as the possibility of acquiring real estate and exploiting agricultural land (without being able to become owner). It also simplifies procedures defined by the Central Bank of Tunisia concerning the transfer of profits made and certain assets. The plan provides for the creation of an investment fund to finance infrastructure and major projects in disadvantaged regions.

According to SACE, the average credit risk of Tunisia is high, with a score of 79/100. Liquidity and bank treasury are an issue in Tunisia. This leads to scarcity of capital and/or high interest rates (TMM), which in turn can penalise the profitability of energy projects.

FIGURE 6 TUNISIA OECD RISK CATEGORY AND S&P'S, MOODY'S, FITCH RATINGS



SOURCE: (SACE, 2019) Indicators' explanations: OECD Country Risk Category, S&P'S rating, Moody's rating, Fitch rating.

POLITICAL AND SOCIAL CONTEXT

Following the Tunisian Revolution of 2011 and the resignation of Zine el-Abidine Ben Ali, the President of the Republic since 1984, Tunisia has faced and still faces significant social, political, economic, and security challenges.

In January 2014, a new Tunisian Constitution was adopted. Legislative elections took place on 26 October 2014, resulting in the victory of Nidaa Tounès. Presidential elections were then held on 23 November and 21 December 2014, out of which Béji Caïd Essebsi emerged as the winner. President Essebsi first appointed Habib Essid to head a coalition government (Carthage Pact) with Ennahdha. In 2016, Youssef Chahed was selected to head a government of national unity in August. Chahed carried out a ministerial reshuffle on 5 November 2018, one year before the 2019 parliamentary and presidential elections.

With the death of President Essebsi, elections were brought forward and held in September and October 2019. As a result, Kais Saied, an independent social conservative, supported by the Islamic-oriented party Ennahdha, was elected for President in a peaceful democratic process. Following legislative elections in October, a fractured legislature has emerged. A swift agreement has been reached to name the President of the National Assembly, Rached Ghannouchi, while forming a Government is needing long coalition negotiations. In January 2020, Prime Minister Designate Habib Jemli presented his choice of a Cabinet – formed by independent technocrats – to the Parliament, that was rejected in a vote of confidence, thus prolonging the behind-the-curtain consultations. The President has appointed former Finance Minister Elyes Fakhfakh to overcome such an impasse, also underlining the importance of economic priorities on the national political agenda.

Reviving the economy and tackling unemployment in particular in rural and internal provinces will be the main internal task for central and local institutions alike. Tunisia has historically its closest ties with the West, and Algeria; new openings to Turkey, Qatar and other Arab countries will be sought as a means to boost trade and foreign investment. Both actions are key to restore hope and curb disillusion in particular among Tunisia's youth. This would in turn help to reduce the many economically motivated protests, that have taken place in the interior and southern Governorates, and in major urban centres, including Tunis.

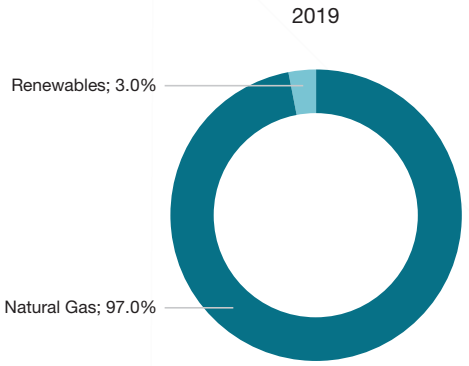
Protests are generally peaceful, yet security remains another of Tunisia's main concerns. The Libyan crisis is leading to there being military operations on the Tunisian-Libyan border in order to avoid the transit of jihadists. Over the past years, there have been some significant security issues in the country resulting in multiple bomb attacks. This particular context negatively impacts the economy, but the tourism sector is still performing relatively well (The World Bank, 2017), also following an increased response by relevant authorities.

2 TUNISIA'S ELECTRICITY MARKET

Historically, Tunisia has been an oil and gas exporting country. Yet, since 1990, oil production has declined while electricity consumption has increased (5.21 TWh in 1990, 9.48 TWh in 2000, 14.52 TWh in 2010, 16.64 in 2016 and 18.99TWh in 2018). This situation has transformed the country into an energy importer since 1999. According to the *Agence Nationale pour la Maîtrise de l'Énergie* (ANME), Tunisia had an energy deficit of around 44% in 2016, which corresponds to 21% of the country's total trade balance deficit. This situation leads to energy security problems and power outages during major summer heat peaks.

In 2018, 97% of the electricity produced has been provided by fossil fuel power plants against only 3% from renewable energy power plants (GIZ, 2019). As of the end of 2018, the Tunisian installed capacity is about 5.5 GW, with 5GW owned by STEG and 471 MW owned by Carthage Power Corporation. Renewable energies have also started to grow in the country with an installed capacity of around 360 MW, broken down as follows: wind (245 MW), hydro (62MW) and solar (55 MW).

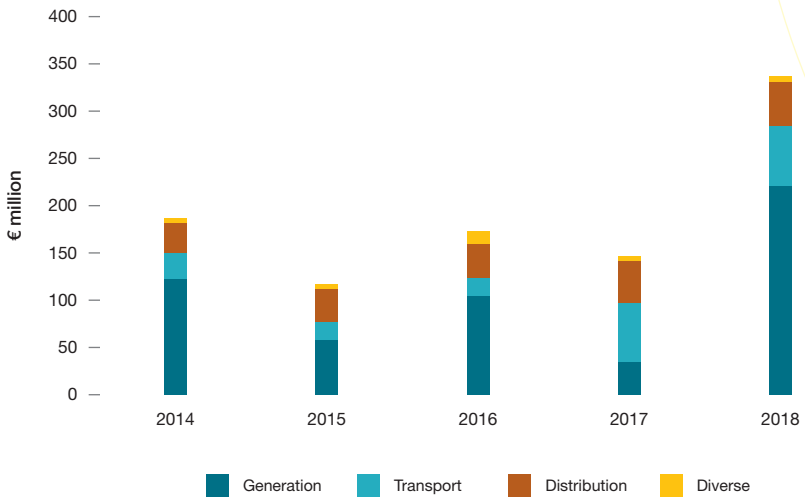
FIGURE 7 TUNISIA'S ELECTRICITY MIX



SOURCE: GIZ, 2019.

In line with the adoption of the recent COP 21 and COP 22 agreements to reduce CO_2 emissions and with the Tunisian Solar Plan launched in 2009, the country aims to increase its share of renewables in electricity production to 30% in 2030, with an intermediate target of 12% in 2020. These measures, aiming to reduce fuel imports and improve Tunisia's energy independence, have already led to an increase of investment in the electricity sector.

FIGURE 8 INVESTMENT IN THE ELECTRICITY SECTOR IN TUNISIA



SOURCE: STEG, 2019.

ELECTRICITY INFRASTRUCTURE

The energy system in Tunisia is vertically integrated. The *Société Tunisienne de l'Électricité et du Gaz* (STEG) is the state-owned, vertically-integrated energy utility company, which has the following missions:

- The electrification of the country
- The development of a natural gas network
- The construction of electricity and gas infrastructure

STEG is responsible for the production of electricity and Liquefied Petroleum Gas (LPG), as well as for the transmission and distribution of electricity and natural gas.

Generation

As of the present, Tunisia mostly relies on STEG, its national energy utility, to produce most of the electricity in the country, while Independent Power Producers (IPPs) own only a small share of the installed capacity (8.6% of the installed capacity). However, the weight of IPPs should increase in the next few years with the Tunisian Government increasingly supporting private developers to develop renewable assets, an ambition laid out in the Tunisian Solar Plan. STEG owns a diversified production portfolio, which is divided into 25 production units (gas turbines, steam turbines, combined cycle, hydraulic and wind power) with an installed capacity of around 5 MW in 2018 (STEG, 2018).

Thanks to interconnections between the two countries, Tunisia buys part of the surplus produced by Algerian power plants, with an exchange threshold of 200 MW. Tunisia also has interconnections with Libya, which has comparatively better infrastructure, though it may have been neglected for some time due to conflicts. A 600 MW interconnection (project ELMED) between Tunisia and Italy is being developed and should be completed by 2027, as financing agreements have already been signed by the Tunisian Government and the World Bank (STEG, 2018). Extensions of existing and planned connections (with Italy, Algeria and Libya) are also being considered. Developing interconnections with neighbouring countries and Europe is considered a key factor by Tunisian authorities and STEG to enable higher shares of solar and wind generation in the electricity mix.

Transport

There has been significant investment in the transmission network over the past few years and the network has grown by 5.3% between 2017 and 2018 (mostly in 150kV and 90kV network), reaching 6,906 km, distributed as follows:

- 208 km of 400 kV transmission network
- 2,910 km of 225 kV transmission network
- 2,382 km of 150 kV transmission network
- 1,406 km of 90 kV transmission network

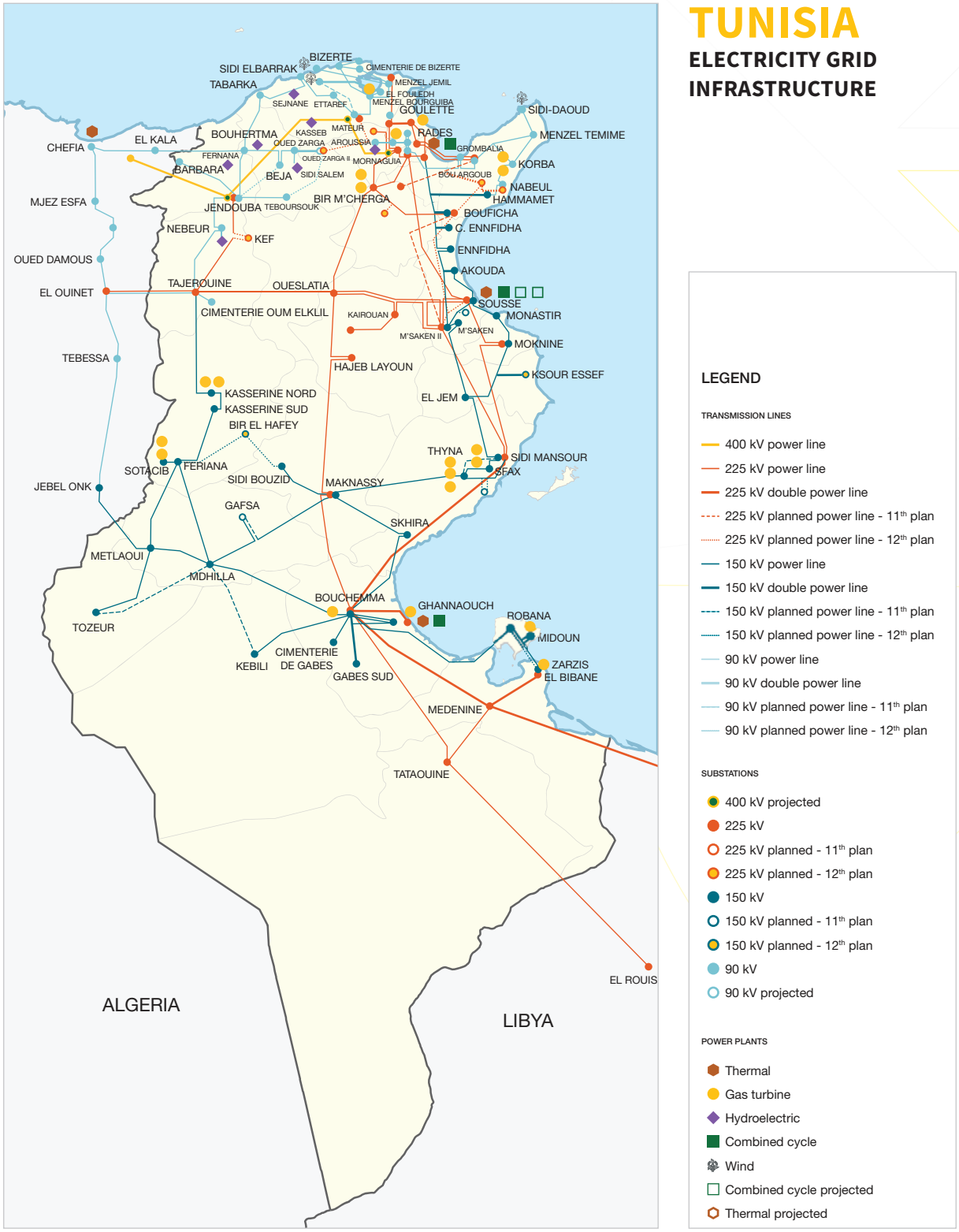
Investments and several feasibility studies have been completed in order to prepare the grid to integrate decentralised generation from renewable energy sources. Over the next few years, a significant strengthening of the 400kV network is expected with the construction of new connections between the South and the North of the country.

Distribution

At the end of 2018, STEG operated and maintained a network of 175,389 km of Medium and Low Voltage lines. The network continues to expand with a growth of 2.4% compared to 2017 (171,316 km) (STEG, 2018).

The positive distribution of the network has enabled an electrification rate of 99.8% to be achieved. Following the country's independence in 1962, rural electrification has consistently been one of the priorities of the various national development plans. A rural electrification plan was launched in the 1970s. In 1973, half of the country's population lived in rural areas and only 6% of them were connected to the electricity grid. Thirty years later, the electrification rate was 96% (The World Bank, 2019b).

2 TUNISIA'S ELECTRICITY MARKET



SOURCE: STEG, 2014.

ACTORS, REGULATORY FRAMEWORK, AND TARIFFS

The different institutions that structure the energy sector in Tunisia are:

- The Ministry in charge of energy, currently the Ministry of Industry and SMEs (*Ministère de l'Industrie et des Petites et Moyennes Entreprises*), formerly the Ministry for Energy and Mines, which was dissolved in 2018 for governance reasons (the leadership of the energy sector was thus transferred to the current Ministry of Industry and SMEs);
- The *Agence Nationale pour la Maîtrise de l'Energie* (ANME) (the national agency for Energy Transformation): a public institution in charge of implementing the state's policy in terms of energy efficiency and the promotion of renewable energies;
- The STEG: the state-owned energy utility company, which has a monopoly on production, transport and distribution of energy (see above)

Although announced in June 2018 and despite the World Bank's recommendations, there is no independent regulatory authority. It has been recognised that the creation of such an authority could significantly speed up the development of renewable energies in the country as it would streamline decision-making and be authoritative with regards to regulatory matters that bear political significance. The independent regulator would also offer more clarity on the legal energy framework as well as arbitration on the access conditions to the networks, prices, and investments.

Tunisia's electricity tariff system is complex and still heavily subsidised. For general low voltage, the tariffs depend on monthly consumption and the consumer's sector.

Tunisia also offers a large range of incentives and subsidies for renewable energy projects. Among these include:

- *Fonds Tunisien de l'Investissement* (Tunisian Investment Fund, FTI): a public fund created in 2016, which provides grants to projects in some specific sectors including renewable energy. The FTI can also invest in equity in some projects.
- *Project d'Intérêt National* (Project of National Interest): qualification criteria on investment size (> EUR 16 Million) or job creation (500 jobs). The project stipulates grants and tax reductions, following the approval of the *Conseil Supérieur d'Investissement*. In the framework of this project, the state also might finance a part of infrastructure work.
- *Fonds de Transition Energétique* (Energy Transition Fund, FTE): offers grants, equity financing and improved loan terms to firms willing to invest in renewable energies (mostly for self-consumption projects)
- Fiscal support, reduced VAT on "renewable energy components" and customs tariffs if there is no local equivalent available. There is also a reduced corporate income tax, depending on the firm's income and location of the project (no tax for a few years, then reduced CIT).

FIGURE 9 TUNISIA'S ELECTRICITY PRICES

		POWER FEES (EUR cents/kW/ Month)	ENERGY PRICE (EUR CENTS/KWH)			
			DAY	PEAK MORNING SUMMER	PEAK EVENING	NIGHT
Tariffs HV	Regular Price	318.9	6.6	9.9	8.9	5.1
	Emergency	165.8	7.2	11.2	10.0	5.4
Tariffs MV	Regular Price	350.8	7.7	11.7	10.5	6.0
	Pumping for Irrigation	-	8.9	NA	Erasing	7.2
	Irrigation	-	6.0	E	6.2	4.4
	Emergency	1,913.2	8.4	13.0	11.6	6.4

SOURCE: STEG, 2018.

2 TUNISIA'S ELECTRICITY MARKET

NEW DEVELOPMENTS FOR SOLAR POWER

To face the problem of energy dependence and to fight against climate change, Tunisia launched the Tunisian Solar Plan in 2009. As previously mentioned, the country aims to install 1 GW of renewable energy to provide 12% of the country's energy needs by 2020. Its long-term objective is to achieve 3.8 GW of renewable energy capacity by 2030. The total investment required between 2016 and 2030 is estimated at 15 billion dinars (c. EUR 4.7 billion).

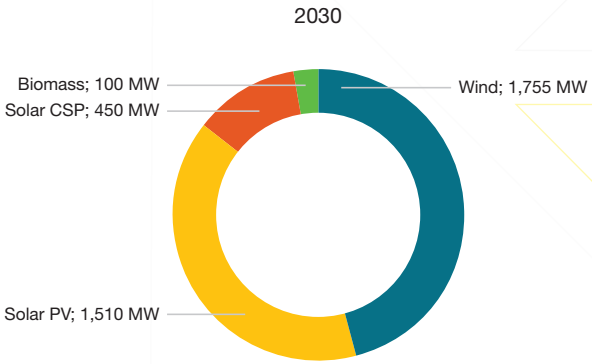
To achieve these objectives, the government has passed the law N°12-2015 on electricity production from renewable energies in 2015. This law completes the existing regulatory framework and provides a legal framework for the development of large-scale renewable energy projects. The 2015-12 law distinguishes three main support mechanisms for renewable energy projects (GIZ, 2019):

- Electricity production for **export**: currently not used;
- Electricity production for **self-consumption ("auto-production")** and sale of surplus: mainly used by energy-intensive industries, either on-site (and planned off-site soon). The surplus is sold to STEG (Law 2009-7) in within the limit of 30% of the energy produced;
- Electricity production for the needs of the Tunisian local market sold under a Power Purchase Agreement (PPA) to be concluded between the producer and STEG for a period of 20 years, extendable for 5 years. This is divided into two regimes:
  - The **authorisation regime**: Projects below 10 MW for solar energy and 30MW in Wind, awarded upon call for tender process;
  - The **concession regime**: Projects over 10 MW for solar and over 30 MW for wind, awarded via concessions after calls for tenders;

Despite the efforts undertaken, the share of renewable energies in the electricity mix was only 3% at the end of 2018, far from the initial objectives. The barriers identified were, among other things:

- The complexity and duration of procedures for granting authorizations;
- The lack of available human resources at the level of the Ministry in charge of energy and the ANME;

FIGURE 10 RENEWABLE ENERGY INSTALLATION TARGETS BY 2030 ACCORDING TO THE TUNISIAN SOLAR PLAN



SOURCE: ANME, 2012.

- The absence of an independent regulatory authority for the electricity sector;
- The legal impossibility for project developers to sell electricity from renewable energies to large electricity consumers;
- The challenge for renewable energy investors to access sites owned by the state.

Subsequently, a set of measures to accelerate the implementation of renewable energy electricity generation projects was presented and approved by the Ministerial Council on 28 February 2018.

Thanks to this acceleration plan, ANME expects, among other renewable technologies like wind, an additional solar PV capacity of 1,154 MW between 2018 and 2022 developed through the following regimes:

- Concession regime (IPP): 500 MW Solar
- Authorisation regime: At least 204 MW,
- Self-consumption: 130 MW,
- To be developed directly by STEG: 320 MW.

In the framework of the "authorisation regime", two rounds of call for projects have already been awarded and a third round is currently being tendered (deadline in November 2019). Their characteristics can be seen in Figure 11, on the following page.

FIGURE 11 AUTHORISATION REGIME CALL FOR PROJECTS

Number of projects round 1	10 projects (6x10MWp + 4x1MWp)
Number of projects round 2	16 projects (6x10MWp + 10x1MWp)
Number of projects round 3	16 projects (6x10MWp + 10x1MWp)
PPA signing date round 1	May 2018
PPA signing date round 2	April 2019
PPA signing date round 3	2020
Total capacity Authorisations	**204 MWp**

SOURCE: Finergreen Intelligence.

The results of the first round of the call of solar PV projects of 64 MW have been published in May 2018 and the second round (Total of 70 MW, 6 developers with 10 MW each and 10 with 1 MW) less than a year later. We expect the results of the third round to be announced in 2020.

All of these projects are either 1 MW or 10 MW and spread over 30 different sites in the regions of Tataouine, Kasserine, Kairouan, Sidi Bouzid, Sfax, Gafsa, Sousse and Béja.

In May 2018, Tunisia also decided to launch a tender for five solar PV projects in the framework of the "concession regime" totalling 500 MW, which were also open to international companies. In November 2018, sixteen national and international developers have been pre-qualified for this tender. These projects will be located in the regions of:

- Tataouine: 200 MW
- Kairouan: 100 MW
- Gafsa: 100 MW
- Sidi Bouzid: 50 MW
- Tozeur: 50 MW

In December 2019, results have been announced and showed extremely low bids below USD30/MWh. The Tataouine 200 MW project recorded the lowest tariff ever reached in Africa at USD24.4/MWh. Results indicated Scatec Solar (200 MW Tataouine, 50 MW Tozeur, 50 MW Sidi Bouzid), NAREVA/ENGIE (100 MW Gafsa) and TBEA/AMEA Power (100 MW Kairouan) among the lowest bidders, which were set to be awarded.

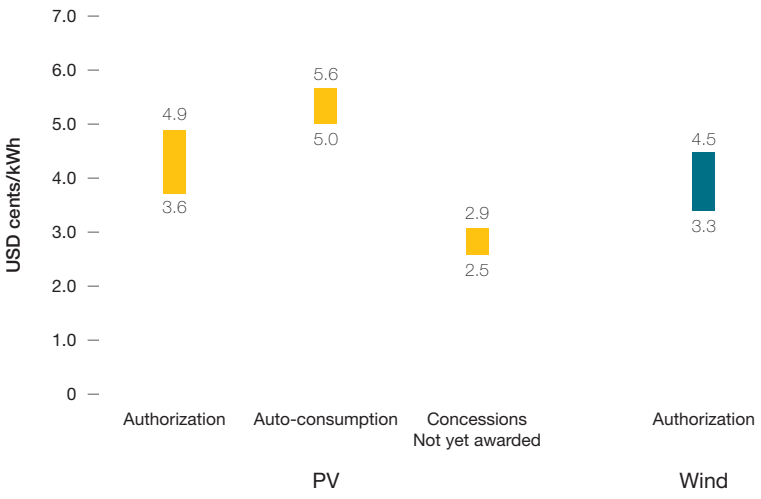
Summary of the bids received in the framework of different support regimes can be seen in Figure 12 below, and Figure 13 on the following page.

FIGURE 13 SUMMARY OF THE BIDS RECEIVED IN THE FRAMEWORK OF DIFFERENT SUPPORT REGIMES

Regime	Solar PV tariffs	Wind tariffs
Self-consumption	150-170 millimes*	-
Authorisation (10 MW projects round 2)	110-147 millimes	100-135 millimes
Concessions**	76-89 millimes	-

*: 1 TND/100 millimes = 0.33 USD – Tariffs/ kWh. **SOURCE:** Press release. **: Lowest bids. **SOURCE:** Meed.

FIGURE 14 SUMMARY OF THE BIDS RECEIVED IN THE FRAMEWORK OF DIFFERENT SUPPORT REGIMES



SOURCE: Finergreen (2019).

Though still too early to interpret the results, as nothing has yet been officially confirmed by the Tunisian authorities, the program might signal some shortcomings which deserve attention. For example, half of the prequalified bidders withdrew from the process during the tender. Among those are some of the leaders in the IPP industry. It is plausible to speculate that some of these withdrawals (especially in the case of financially solid entities) may be related to the terms of the PPA. Indeed, the European Bank for Reconstruction and Development (EBRD) assessed the PPA terms as not fully bankable (EBRD, 2018), an assessment confirmed by UNDP. The lack of state guarantees in PPAs has likely also reduced the appetite of some development finance institutions and well-known financing institutions.

It has also been observed that the competition was somewhat unsuccessful in driving prices down, with some globally active major firms bidding higher in Tunisia than in other markets. For example, ACWA Power, which has demonstrated its ability to propose extremely competitive tariffs in Africa and the Middle East (e.g. Ethiopia bids at USD2.5 cents/kWh), has offered quite average tariffs, i.e. around USD 3.5 cents/kWh. Nonetheless, the bids received were all in all very competitive.

BANKABILITY OF PPAs IN TUNISIA

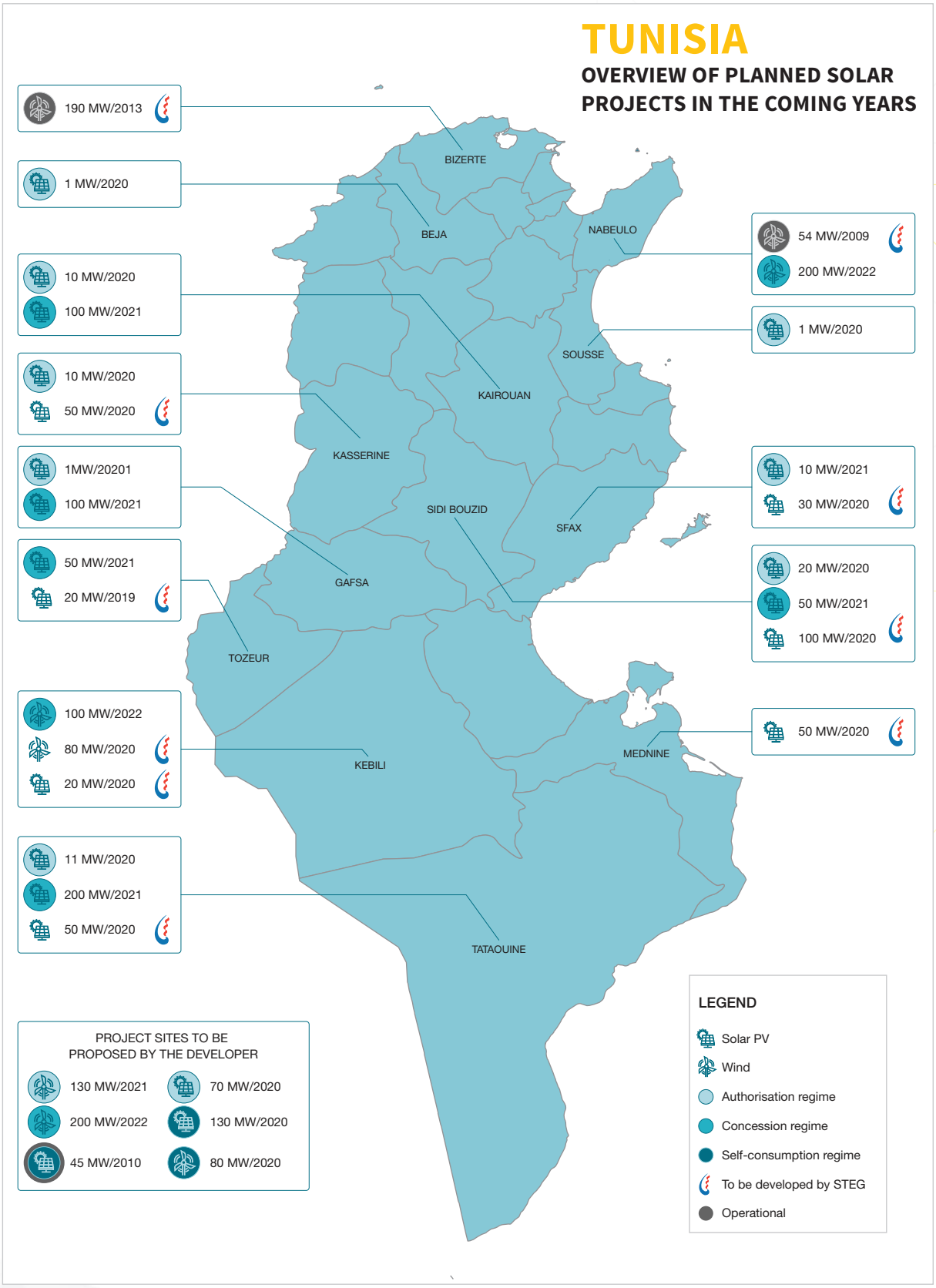
Today, the PPA template proposed by the Ministry of Energy under the authorisation region is said not to be "completely" bankable according to international standards (EBRD, 2018). The absence of a state guarantee, as well as terms linked to change in the law, force majeure events, and litigation mechanisms can cause problems for some developers or development banks when negotiating funding. The design of PPAs is the responsibility of the regulatory authority (ANME), responsible for ensuring that PPAs are competitive in the interest of the private sector and are attractive to investors. Despite these issues, some projects of the first round of the authorisation regime have found enough financial resources and are currently being built. Still, improving the PPA terms could have a significant impact on the bankability of the projects and could result in even lower tariffs.

Local banks increasingly play a role in the local renewables economy, especially in the financing of smaller 1 MW PV projects. There are some examples of lending mechanisms supported by the *Agence Française de Développement* (AFD) and rolled-out locally, which allow local banks to lend at better conditions than regular commercial banking loans (Ligne SUNREF). Here, the bankability of PPAs is less of a risk, as amounts and projects are less strategic.

The authorisation regime faces some challenges too. Whereas the interest of developers remains strong, it is mostly due to the worsening of financing conditions. Unattractive local financing conditions were especially affected in the first round of the authorisation project, because it was mostly won by local developers. In these cases, the tariffs are non-indexed to a hard currency (e.g. USD, EUR) and thus local developers rely on local financing. When bids were made in November 2017, the average money market rate (TMM) was of 5.23%, and commercial interest rates of 7-7.5%. In less than two years, the TMM increased by half, reaching 7.8%. This made projects hardly bankable and has slowed down completion. As of now, without the generous subsidies given through the FTI and FTE, these projects would simply not be pursuable. Conditions improved in the second round of the authorisation project, with all winning consortia, except the ones covering the 1 MW tranches, including international developers able to generate financing from abroad at more competitive and stable interest rates.

The project map of ANME on the following page shows solar projects planned for the years to follow.

2 TUNISIA'S ELECTRICITY MARKET



SOURCE: ANME, 2018.

Thanks to the efforts described above, Tunisia has a good position in the Regulatory Indicators for Sustainable Energy (RISE), scoring above the average of African countries (overall score: 83).

The RISE scores reflect a snapshot of a country's policies and regulations in the energy sector. The score looks at the three pillars identified by the the SEforAll initiative: Energy Access, Energy Efficiency, and Renewable Energy. Indicators are assigned to each pillar to determine scores. According to this index, Tunisia's score is 83/100, above the average of African countries (RISE, 2018).

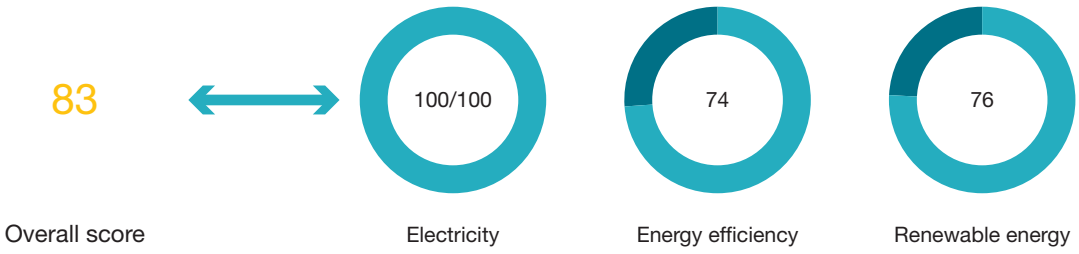
INTERNATIONAL SUPPORT

Being a developing country, Tunisia benefits from a large support network of development institutions. This support comes in different form, such as policy advice, technical assistance, or financing facilities. One of the most active organisations in the solar and renewable sectors in Tunisia is the German development cooperation GIZ. GIZ has been supporting the Tunisian Solar Plan and providing capacity building to enhance local capabilities related to renewable energy for local financiers, industrials, as well as policy makers and public institutions. The EBRD has also been very active in the country, supporting the tender organised by the STEG and providing financing solutions and support to the developers. Other players are also active, such as:

- *Agence Française de Développement* (AFD): Creation of a credit line Sunref, providing better conditions than regular financing and offering possible grants with UBCI, UIB, Amen Bank and BH Bank, with facilities comprised between EUR 10 and 20 million.
- International Financial Corporation (IFC): Loan of EUR 40 million to Attijari Bank to support climate related projects and smaller business.
- United Nations Development Program (UNDP): Support of the Tunisian Solar Plan as part of their Nationally Appropriate Mitigation Actions (NAMA) activities.
- European Commission (EU): Funding of the Tozeur PV Plant (10 MW) for EUR 1.5 million, "Energy Transition Goal' Program, support the improvement and operationalisation of regulatory and technical measures to develop renewable energies with regards to grid reinforcement and the implementation of an independent regulating authority of the electricity sector. Tunisia is also in the scope of the EU External Investment Plan (EIP), which has a specific focus on de-risking renewable energy projects.

Other institutions such as the Green Climate Fund (GCF), the Islamic Development Bank (IsDB), the European Investment Bank (EIB), the German development bank (KfW), and the African Development Bank (AfDB) also have activities in Tunisia and are genuinely interested in renewable energy.

FIGURE 15 REGULATORY INDICATORS FOR SUSTAINABLE ENERGY (RISE) FOR TUNISIA



SOURCE: RISE, 2018.

3 RECOMMENDATIONS

FOR LOCAL POLICY MAKERS

The creation of an independent energy regulatory agency, under the Ministry of Energy is essential for the development of renewable projects. The features of such regulatory entity could potentially mirror the similarly-purposed INT (*Instance Nationale des Telecommunications*).[2] Regulatory and operational roles need to be clarified and clearly separated to avoid conflicts of interest. The regulator should oversee the liberalisation of the electricity sector and prepare the ground for the development of interconnections, cross-border trading of electricity with neighbouring countries and Europe. The state-owned energy utility STEG exerts significant influence over renewable project development by the private sector. STEG is the sole authorised off-taker of electricity produced by private projects for local consumption, and of up to 30% surplus from the self-consumption regime. Moreover, STEG is a member of the commission tasked with granting authorisations for renewable projects for local consumption and auto-generation. Finally, STEG is the grid operator responsible for ensuring overall efficiency and reliability in Tunisia's grid.

The bankability of PPAs for renewable energy projects should be further improved, as demonstrated by the high share of withdrawals from the current tender process. Under the authorisation regime, it is recommended to introduce a state guarantee for the electricity produced to enhance investments' attractiveness. Under the concession regime, PPA terms and conditions related to change of law, force majeure and dispute resolution should be revisited in line with international standards, in order to further improve investor confidence. Moreover, development financial institutions should be part of the concession regime's PPA providing financial guarantees for the counterparts.

Renewable energy financing capabilities of local commercial banks should be further supported. Continuing to propose subsidised financing facilities for renewable energy projects could be a useful tool. Offering concessional loans through state-owned banks with more competitive terms (regarding long-term financing, reduced interest rate, non-recourse etc), as well as co-financing mechanisms with DFIs and local commercial banks should also be explored. Such measures could strongly enhance the local capabilities to develop projects at a relatively low cost for the government.

The intermediate targets and deployment schedule for renewable energy development should be clarified. Thanks to the Tunisian Solar Plan, the 2030 targets are clear. However, the achievement of the 30% 2030 target and the 12% intermediary 2020 target are not on track, in spite of measures undertaken and some successes. To facilitate new projects and attract more investors, it is key to build market confidence and trust among all stakeholders through increased transparency and visibility of intermediary targets. Tunisia should announce a multiannual roadmap with annual target volumes to be installed (i.e. 1GW in the 2020-2025 period at a yearly run rate of 200MW). The authorities should organise international auction programs to attract private investors for on-grid solar projects consistently with identified intermediary targets. Tenders should be based on clear rules and technical parameters such as size, targets, location and timeline, in order to produce the expected outcomes. Well-designed tenders also attract participants and facilitate the financial structuring of the projects.

Increasing the size of the projects for the future rounds of the authorisation regime might also be a good way to help them reaching financial closure. As of now, the size of the projects under authorisation regime are too small to interest most of the development finance institutions (DFIs). If more DFIs were involved in Tunisia, they might pool with local commercial banks and thus enhance their capabilities. Moreover, DFIs are able to offer more competitive financing conditions to such projects.

Administrative processes for renewable energy development should be further streamlined to reduce transaction costs and increase investment attractiveness. Current challenges are due to delays in receiving information and responses from the grid operator STEG and in having the grid connection constructed. Some of these challenges could be addressed by simplifying procedures, introducing a one-stop shop, possibly a simple notification system for small projects, and enhancing the use of digital tools to provide information to and communicate with project developers.

2 The National Telecommunications Authority (INT) is a specialized body set up by Article 63 of Law No. 2001-01 of 15 January 2001 promulgating the Telecommunications Code, as amended and supplemented by Law no. 2002-46 of May 7th, 2002, the law n ° 2008-01 of January 08th, 2008 and the law n ° 2013-10 of April 12th, 2013. It has civil personality and financial autonomy and has a flexible administrative and financial organization adapted to its role as regulator of the telecommunications sector.

FOR INVESTORS

Seize opportunities: Variety of sizes of projects, stable long-term legal frameworks, and growing needs will bring liquidity in terms of the number of assets to the benefit of investors.

The country shows a strong potential for the development of renewable energies, especially for solar power. With growing electricity consumption, the need to meet the nationally determined contribution (NDC) committed by Tunisia at COP21-22 and translated into its solar plan, Tunisia represents a real opportunity for investors seeking renewable energy investment opportunities.

Though solid bankability of PPAs is still to be formally demonstrated, long-term tenders, the country's stable legal framework, as well as the Tunisian government's strong political support for renewables all contribute to raising investors' confidence and interest.

Moreover, with the multiplication of solar farms of different sizes in the country, IPPs will need to ensure the after sales service. This will lead to operation & maintenance (O&M) activities based on monitoring and analytics. Digitalisation of these processes is essential to optimising O&M, to increase the lifetime of the assets and to make money savings. These projects represent a big potential for companies active in the field of digitalisation & solar.

FOR LOCAL PRIVATE STAKEHOLDERS

Local companies should continue to be at the heart of Tunisia's energy transition. With the creation of the R&D and training technology park of Borj Cedria in 1983, Tunisia has invested early on in the development of local skills that can continue to be valorised in the context of solar project development. Moreover, consistently with the objective of opening the Tunisian market to international and European players, local companies are increasingly expected to comply with international standards that may be new to them. While concrete results in facing this challenge are being recorded, efforts should continue to be devoted to increasing cooperation with European and international partners to exchange best practices and acquire new skills, often leading to better access to financing opportunities.

FOR DEVELOPMENT FINANCE INSTITUTIONS

Development finance institutions are key players in Tunisia and should continue assisting the development of a sustainable market for private investments. Their financial, technical and governance support currently drives investments in renewables. Furthermore, their presence reassures investors concerned by the country's macroeconomic fundamentals and contributes to sharing best practices.

The long-term commitments of development finance institutions in a country contribute to providing credibility to national policies; their country strategies are taken into high consideration by international investors. Technical assistance programs and other forms of support from international development institutions are key in the energy transition of the African continent.

Multilateral development finance institutions such as the World Bank and the African Development Bank already provide credit enhancement instruments ('partial risk guarantees'). Starting from 2019 the European Fund for Sustainable Development within the framework of the EU External Investment Plan will provide an EU-backed guarantee for renewable energy projects. Ease of access to such schemes and correct pricing are two key factors for attracting investments.

In addition to the digitalisation of energy production and distribution, development finance institutions should promote solar and storage technology, by both encouraging technology transfer and supporting actual projects. Indeed, without storage, renewable energy production will remain intermittent and will not succeed in displacing large volumes of generation from highly polluting fossil fuels. Digitalisation and storage are key factors in promoting the energy autonomy of Tunisia.

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"Investors seeking renewable energy investment opportunities are increasingly looking at Tunisia as an attractive market. To satisfy growing electricity demand and meet its nationally determined contribution (NDC) to the 2015 Paris Agreement, Tunisia is stepping up its game to pursue its ambitious energy diversification strategy, promoting renewable energy development and energy efficiency. With an average horizontal irradiation of around 1,850 kWh/m2/year, the country has abundant solar resources. These resources are promisingly being developed to strengthen Tunisia's energy independence, while also being leveraged for exporting clean electricity to Europe, creating value and jobs locally."

Stefano Mantellassi
Vice-President Energy Solutions, Eni SpA

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