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Assessing EU–Mediterranean Policies in the Fields of Energy from a Bottom-up Perspective: The Case of Tunisia

Jean-Yves Moisseron, **Khaled Guesmi** and **Marie Gerin-Jean**

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Assessing EU–Mediterranean Policies in the Fields of Energy from a Bottom-up Perspective: The Case of Tunisia

Jean-Yves Moisseron, Khaled Guesmi and Marie Gerin-Jean[1]

Abstract

The present report analyses the situation of Tunisia concerning the energy sector in the framework of the EU-funded project MEDRESET. It aims to investigate Euro-Mediterranean policy in the energy sector from a bottom-up perspective. The main findings are the following: concerning energy, Tunisia faces a huge change in its energy status. Until the revolution, Tunisia had covered its energy needs thanks in particular to the gas royalty fees from the Algerian–Italian pipeline. In 2000, it became a dependant country with a growing deficit. Due to the revolution context, implementing a stable energy policy was not a possibility. Smuggling and illegal trade with Libya increased, while energy subsidies reached 7 per cent of GDP. Tunisia has suffered from a growing lack of investments. Considering such challenges, the people's welfare and the local needs, EU policy regarding energy in Tunisia remains very limited with two Neighbourhood Investment facilities: 1 million euro for SUNREF in 2015, and 1.5 million euro for the Tozeur power plant. The EU has also offered a grant (e.g., European Neighbourhood and Partnership Instrument) of 975,000 euro for a photovoltaic power plant in Nabeul. This must be compared with the global European Neighbourhood Instrument of 213 million euro in 2016 for Tunisia. In sum, the EU energy policy in Tunisia is marginal.

1. Methodology

MEDRESET Work Package 6 (WP6) Energy aims to investigate Euro-Mediterranean policy regarding energy to deconstruct the theory and practice and try to pave the way for a new approach or consolidate what has been done so far. In particular, the research seeks to understand if EU policies in the energy sector in Tunisia respond to people's welfare and local economic needs (e.g., job creation, industrial diversification, effects for local firms vis-à-vis multinational companies, and so on). The methodology used to establish this report complies with the methodology specified in MEDRESET's Methodology and Concept Paper No. 8, as defined in section 4 of that document (Moisseron et al. 2017).

The study used different sources: first, the available documents on the energy sector in Tunisia including academic papers, grey literature, flyers and so on. A content analysis of these documents was made and used notably to underline critical or specific concerns. A second important source is the interviews with the identified stakeholders. First, a map of stakeholders

1 Jean-Yves Moisseron is Research Director at the Institut de Recherche pour le Développement (IRD) and Professor at IPAG Business School. Khaled Guesmi is Finance Professor at IPAG Business School and Visiting Professor at Telfer School of Management, University of Ottawa. Marie Gerin-Jean is a PhD student at the Pantheon-Sorbonne University.

was established, paying particular attention to ensure a heterogeneous sample, including actors who have been excluded by EU interventions such as the Euro-Mediterranean dialogue as well as those with credible claims to grassroots representation. We conducted a first round of 17 face-to-face interviews in July and in October 2017 (see Annex 1). A second round of 4 interviews was conducted in January 2018. We encountered some difficulties in organizing meetings with the stakeholders (no answer or late cancellation of meeting). Incidentally, it should be noted at this point that the vision of the EU's activities concerning energy was blurred and only a few respondents could clearly identify EU projects. Despite the lack of responses, we succeeded in obtaining a good sample of the stakeholders in five categories: (i) public actors (administration and public bodies, 4 interviews); (ii) private sector (companies and professional organizations, 3 interviews); (iii) NGOs (4 interviews); (iv) academics and think tanks (3 interviews); and (v) international organizations (3 interviews).

Regarding the gender composition of the interviewees: seven were females, and the rest were males. This division reflects the fact that the energy sector tends to be a male-intensive sector, in terms of policy-makers, institutional representatives, private sector and employees. This means that we faced enormous difficulties in finding women available for the interviews.

We based the semi-structured interviews on the list of questions presented in Annex 2. We tried to obtain answers to the central research questions of the MEDRESET project and more precisely: What issues do local stakeholders deem most relevant? How do they perceive and assess European policy in the region and in their specific policy area? And what are the main policy recommendations?

2. Overview of the Tunisian Energy Sector

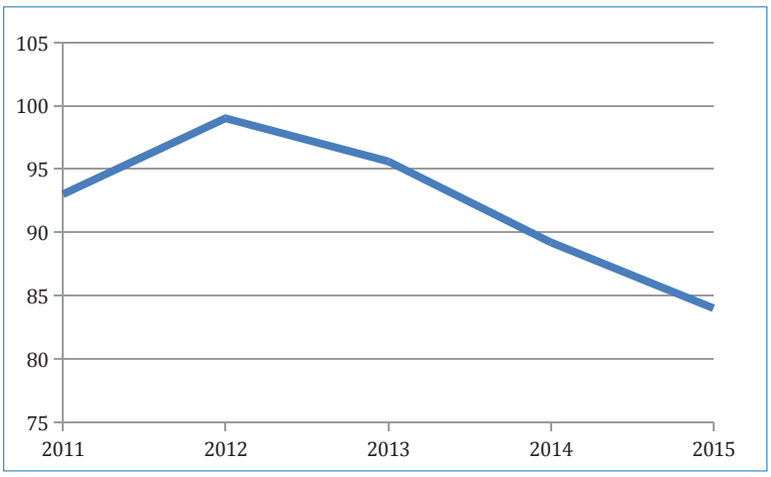
2.1 Key Challenges

2.1.1 The Growing Energy Deficit

The energy sector has gone through a difficult period since the revolution in 2011. It has been neglected during the last years while it requested specific attention. Protests by local populations against the companies, strikes inside the sector, and the decrease in investments explain the present situation. Based on the energy index of industrial production (base 100 in 2010), the energy sector has continuously declined since 2012 (see Figure 1).

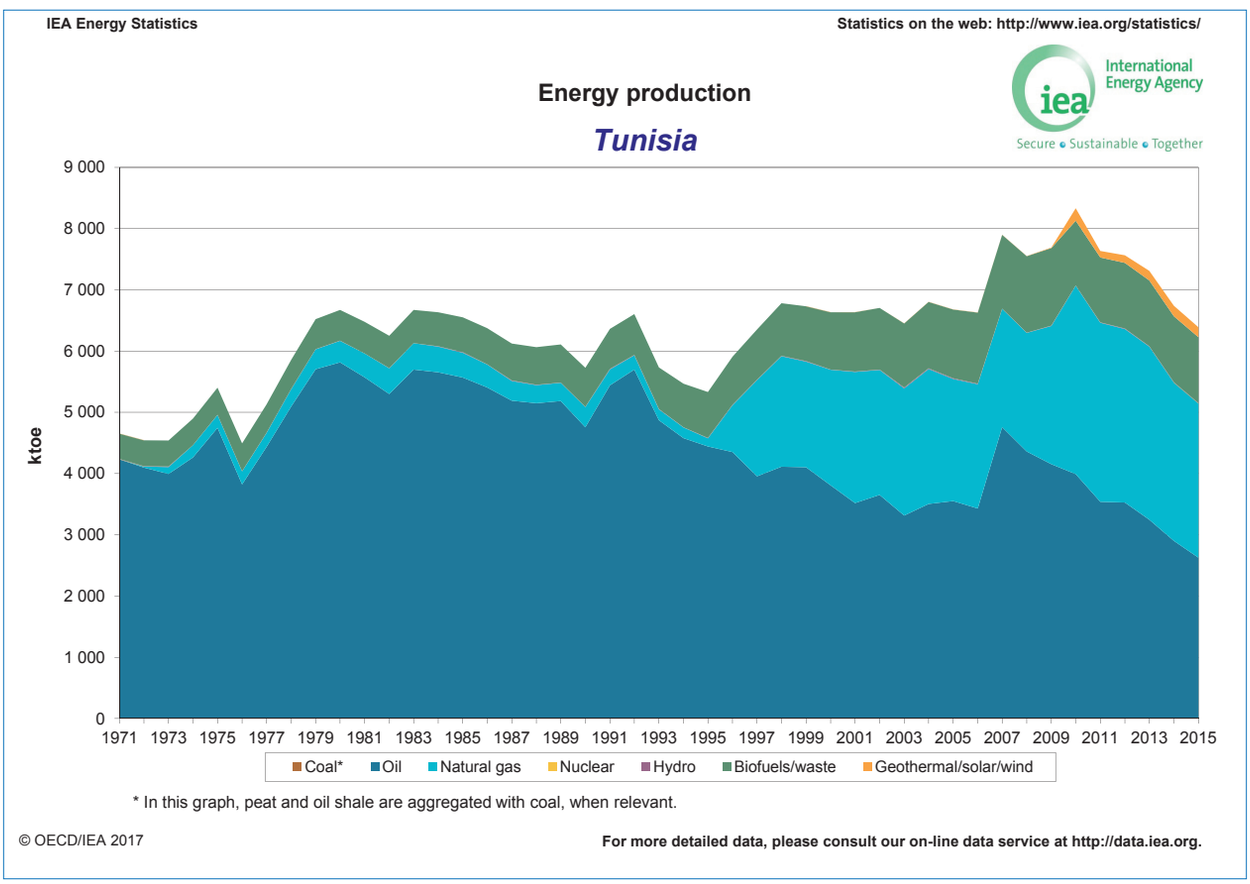
One of the explanations relies on the resources used by Tunisia to produce energy: the energy mix structure is composed of 46.2 per cent gas and 42.4 per cent oil (IEA 2017b).

Figure 1 | Annual industrial production index: energy (unit: 2010=100), 2011-2015



Source: INS website: *Statistics by Topic: Industry*, http://www.ins.tn/en/themes/industrie.

Figure 2 | Energy production, 1971–2015



Source: IEA (2017a).

Table 1 | Final energy consumption in Tunisia (unit: 1,000 toe), 2016

	Petroleum products	Natural gas	Renewable energy	Electricity	Total
Industry	873	786	--	466	2,124
Transport	2,148	231	--	8	2,387
Household	1,014	387	913	864	3,178
Final energy consumption	4,034	1,403	913	1,339	7,689

Source: Ministry of Energy (2018: 3).

Tables 2 and 3 below show the fall in production and how fast demand has increased.

Since the 1980s, domestic production has faced a progressive depletion of reserves leading to a continuous fall. Tunisia was able to satisfy its energy demand thanks to the contribution of Algerian gas transiting through the country. The balance was positive till 2000. After the revolution, the situation worsened, and the deficit has increased sharply since 2014. Domestic fossil fuel production has declined, and research and exploration activity have slowed.

At the same time, energy demand has continued to increase. Recent projections show an increase in electricity demand with an annual growth rate of 5 per cent for the coming years (Cherif and Mobarek 2016). This is due to the demographic growth but also the economic development of Tunisia.

Table 2 | Primary energy production (unit: 1,000 toe), 2012–2016

	2012	2013	2014	2015	2016
Crude oil	3,409	3,128	2,903	2,627	2,505
Natural gas	2,515	2,510	2,301	2,231	1,969
Primary electricity	26	36	48	45	45

Source: INS website: *Statistics by Topic: Energy*, http://www.ins.tn/en/themes/energie.

Table 3 | Commercial energy consumption (unit: 1,000 toe), 2012–2016

	2012	2013	2014	2015	2016
Fuels	3,823	3,912	4,301	4,571	4,324
Natural gas	4,712	4,793	4,897	4,685	4,685
Primary electricity	26	36	48	45	45

Source: INS website: *Statistics by Topic: Energy*, http://www.ins.tn/en/themes/energie.

One of the main challenges facing Tunisia is the massive energy deficit which reached almost 4 million toe in 2016 (Abid and Dos Reis 2017, Table 4).

Table 4 | Evolution of the Tunisian energy deficit (unit: 1,000 toe), 1990–2016

1990	1992	1994	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016
900	1,300	-50	250	400	0	-500	-600	-700	-750	-460	-1,500	-3,690	-3,898

Source: Ministry of Energy data.

Today domestic production covers only 40 per cent of consumption, while 60 per cent of energy supply is imported. This dependency negatively impacts the state budget as external costs are not transferred to final consumers. Furthermore, the energy bill is about 16 per cent of the global budget deficit, and subsidies to energy price represented 13.7 per cent of the Tunisian state budget in 2012 (compared with 8.7 per cent in 2008) (ANME 2014: 10). This energy dependence increased in 2016 compared to 2015 (Business France 2017) and became a severe issue for the Tunisian government.

2.1.2 A Centralized System Challenged by Renewable Energy and the EU Relationship

The Tunisian energy sector is highly centralized and controlled by the state. The major actor, the Tunisian Company of Electricity and Gas (*Société Tunisienne de l'Electricité et du Gaz*, STEG), acts as a monopoly on the electricity market. The STEG was created in 1962 with a strong political mandate from the Ministry of Energy.[2] This state-owned enterprise has played an essential role in the national strategies. The Tunisian National Oil Company (*Entreprise Tunisienne d'Activités Pétrolières*, ETAP) is in charge of exploration, exploitation and trade of hydrocarbons. Tunisia's national company AGIL distributes oil across the country. Through the STEG and the public bodies, the state has an overall control on the production and the supply of energy. The STEG has acted as a quasi-monopoly making it the only granted operator to produce, transport and export electricity. In 2012 this public company produced more than 80 per cent of Tunisian electricity (Oxford Business Group 2017a).

Two independent private producers (IPPs) produce the rest of the electricity. Carthage Power Company, the principal and the older of the two, produces and distributes electricity through its combined cycle (natural gas and diesel-fired). In 2012, the company generated 25 per cent of the electricity produced in Tunisia.

As the STEG is the national utility and holds a monopoly on electricity production, private companies are more present in the hydrocarbon segment. The ETAP stated-owned company produces a significant share of domestic energy supply through oil and gas concessions. These concessions given to the private sector are owned by ETAP, with a 50 per cent minimum of their capital. The state-owned company AGIL holds the market with a number of foreign private companies (i.e., Total, Shell, BP).

Since the late 2000s, the Tunisian government and its foreign partners have announced plans and policy reforms to develop renewable electricity. In 2016, generating capacity of renewables reached 342 megawatt (MW) and represented 6 per cent of domestic energy needs (Oxford Business Group 2017b). The rising importance of renewable energy (RE) challenges the

2 See STEG website: *History*, http://www.steg.com.tn/en/institutionnel/historique.html.

centralized structure of the energy sector. RE can be developed if a lot of a new actors, private investors, municipalities and communities get involved in projects and find funds to invest. But this requires a decentralization of the sector and opportunities for the private sector to produce electricity and supply it to the general grid. It requires also that the dominant state company, which historically managed the whole system, accepts playing by the rules of a new game. Tunisia is at the starting point of this process. At the beginning of 2017, the STEG's move from resistance against renewable energy to public–private partnership has marked a turning point.

Since 2017, the government has launched tenders for construction of several wind and photovoltaic power stations, amounting to some 137.7 million euro, to develop 210 MW of capacity (70 MW solar power and 140 MW wind power). As Morocco did for its Big Solar Plan in the desert, Tunisian government is trying to attract private investments to the nascent renewable energy sector.

The state's control over the energy sector is changing to some degree. The Tunisian revolution was a turning point that challenged power relations proposed by energy stakeholders. New actors (private sector, NGOs, researchers) contest the pre-eminent position held by the STEG. These transformations have permitted the timid emergence of alternative collective actors focused more particularly on wind power and photovoltaic technology. But until now these new opportunities have remained at an early stage.

However, there is an element that may hinder the development of a decentralized and dynamic energy sector. The frame of the Tunisian public policy concerning RE is identical to Moroccan strategy. Preference is given to big power plants connected to the central grid. To finance these projects, the Tunisian government aims to sum up the development aid as well as private investment. These projects should be led in the form of public–private partnerships in which the private consortium brings part of the investment (equity). The size of the projects and the financing modalities limit the number and the kind of actors able to take part in this public policy. The instruments are convenient for big companies. Contrary to the "bottom-up" or participative initiatives, the renewable energy sector in Tunisia is set vertically and is deeply institutionalized. The TuNur project (see below), as was the case for Desertec, embodies that philosophy. Instead of promoting peer-to-peer, small and smart units, the Tunisian government goes for large solar or wind power stations easily controlled by the authorities.

2.1.3 A Sector Based on Hydrocarbon in Need of Diversification

Dependence on external supplies is linked to complex factors. Tunisian electricity generation is currently 95 per cent dependent on gas (Lechtenböhmer et al. 2012: 18). Hydrocarbons are almost the unique source of energy production.

The choice to favour gas can be explained by economic and geographical reasons. Neighbouring Algeria is a significant hydrocarbon producer and exports its gas to the European continent through a pipeline that crosses Tunisian territory. Tunisia benefits from a portion of the gas exported (5.625 per cent) by Algeria, called "fiscal gas", in exchange for the crossing of the gas pipeline on its territory. At first, the increased capacity of the Trans-Mediterranean Pipeline has allowed the growth of the Tunisian quota and has met the growing demand for energy (Table 5). But national gas production has declined since 2010 to reach the same volume as Algerian

gas imports in 2015 (IEA 2017b). At the same time, Algerian gas exports to Europe decreased as well as the gas received by Tunisia in royalties (Krimi 2018). The situation could be even worse because Algeria is planning to build another pipeline directly between the Algerian borders to Sicilia without crossing Tunisian territory. This would deprive Tunisia of this resource.[3] At the end of 2015, 74 per cent of natural gas consumption was used for electricity production; the rest of the gas used comprised 5 per cent for industry and 21 per cent for residential and the tertiary sector.

Table 5 | Evolution of fiscal gas (1,000 toe), 1990–2015

1990	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
592	1,210	1,164	1,154	1,043	1,148	972	785	741	924	559	299	317

Source: El Haddad (2016: 26).

Regarding oil production, the single oil refinery in the country does not cover the local needs. Tunisia imports a large part of the refined products consumed in the country, mainly diesel. In 2016, a significant portion of electricity was generated by the natural gas power plants. This dependency could represent an obvious supply risk.

2.2 National Energy Policies

Since decolonization, the Tunisian energy strategy has been based on three principal axes:

1. The first challenge was to reduce national energy dependence by intensifying oil and gas exploration and exploitation in a context of decolonization, in a country with fewer energy resources than neighbouring countries (Rocher and Verdeil 2013: 281).
2. The second challenge was to extend electricity coverage to make it available across the country (resulting in a 100 per cent electric distribution rate in cities and 98.5 per cent in rural areas in 2018) and by promoting social development based on extensive energy subsidies.
3. The third challenge was energy management and the development of renewable sources. This last axis was concretized by the creation, in 1985, of the National Agency for Energy Conservation (*Agence Nationale de la Maîtrise de l'Energie*, ANME).[4]

Starting in 1980, to face the long-term energy deficit, the successive governments have taken two main kinds of action: firstly the intensification of oil and gas research and exploration, and secondly, the encouragement of energy reduction as well as the production of new renewable energies. However, Tunisia is the first country in the Maghreb to have conducted a proactive efficiency campaign since the late 1990s and early 2000s when the country's demand began surpassing domestic production.

3 "La Tunisie privée de 5 millions de mètres cubes de gaz Algérien par jour?!", in *Espace Manager*, 2 June 2015, https://www.espacemanager.com/la-tunisie-privee-de-5-millions-de-metres-cubes-de-gaz-algerien-par-jour.html.

4 Created in 1985, ANME is a non-administrative public institution under the supervision of the Ministry of Industry. Its mission is to implement state policy in the field of energy management through the study and promotion of energy efficiency and renewable energies. See ANME website, http://www.anme.nat.tn.

Since the 2000s, international donor agencies, such as the World Bank, are challenging the STEG's monopoly and have recommended the privatization of Tunisia's electrical sector (Rocher and Verdeil 2013: 283). Accordingly, the government has engaged in a few public–private partnerships,[5] but the STEG has shown a high resistance to these privatization requests.

The first point of criticism from the World Bank is that the STEG is not a sufficiently innovative company (Rocher and Verdeil 2013: 286). In this respect, it would always favour conventional thermal technologies despite their high cost. Thus the STEG underestimates the profitability of renewable energies and the conditions of their connection to the grid, and ultimately ignores their potential. Some of these criticisms are coming from the ANME as well as from actors and observers from the industry or the Tunisian Court of Auditors. They point out that procedural complexity reduces the efficiency and sustainability of the system. The second criticism is more ideological and questions the STEG's public monopoly strategy to ensure electric distribution.[6]

Another critique concerns the capacity of the Tunisian government to implement energy subsidy reforms. It continues to struggle against the strong actors of the sector such as the STEG. However, the revolution has had significant consequences for the STEG's ability to stand its ground. The month following the revolution, the STEG was facing critical challenges: increases in the cost of subsidies and growing refusal from the population to pay their electricity bills. The customers became critical about energy prices even if costs in Tunisia are already lower than the world energy market price (Bennasr and Verdeil 2014). The STEG had to face internal dissent from both employees and customers. The electrical Union (affiliated to the UGTT, see below) was quite resistant to renewable energy projects and argued that the creation of the STEG-ER (STEG Renewable Energy) was a foreshadowing of STEG privatization. The Electrical Union is powerful. It is attached to the civil servant status of the employees and defends the monopoly status of the STEG. But its interests converge with those of the STEG, which is quite reluctant or cautions concerning the development of RE, seen as a door to the private sector and the beginning of a privatization process.[7]

Before the revolution, STEG and ANME top management revealed themselves to be close to the Ben Ali regime, and these shared interests explain the partially blocked energy transition. According to researchers, corruption and lack of transparency are also a barrier to reform of the subsidy system (Eibl 2017). Eibl explains how people in business benefit from the energy subsidies system: "While these descriptive figures are not evidence that these actors enter sectors because of energy subsidies, they nonetheless highlight the fact that politically connected actors have been amongst the major beneficiaries of energy subsidies" (Eibl 2017: 4).

In fact, the actors who benefit the most from the subventions of the price of energy are the most energy-consuming– among them, manufacturers of cement, textiles and chemicals. Fuel subsidies give priority to companies in the transport and logistics sector.

5 In the late 2000s a combined cycle plant was built and opened by a private American–Japanese firm.
6 "Energies vertes: la Tunisie déterminée à rattrapper le temps perdu", in *Kapitalis*, 8 May 2018, http://kapitalis.com/tunisie/2018/05/08/energies-vertes-la-tunisie-determinee-a-rattraper-le-temps-perdu.
7 "Le Syndicat de la STEG en grève le 15 juillet pour protester contre un projet de loi", in *Webdo*, 30 June 2014, http://www.webdo.tn/?p=63924.

Energy thus became an issue for the civil society agenda. Social acceptability of energy infrastructure projects became a crucial and symbolic matter, as witnessed by the eagerness of social contestation concerning corruption in this sector. The campaign "*winou el-petrol*" is an example: the distribution of mineral resources benefits was considered as unfair. Moreover, shale gas extraction with hydraulic fracturing in Tunisia still meets strong opposition. Hydraulic fracturing is criticized for its environmental consequences. A first Mediterranean Forum against fracking and shale gas was organized in Bizerte in May 2015 (Tiss 2015). The civil society in Tunisia, Morocco and Algeria sought to join their action in the Collectif Euro-Maghrebin Anti gas de Schiste.[8] Facing this opposition, the Tunisian government launched in early 2017 an environmental impact study on shale gas, which should lead to a political decision (Galtier 2017).

2.2.1 Major Policy Instruments

Over the years the Tunisian government has implemented different programmes to embody the general purposes of its reforms.

Prosol programme: Since 2005, the Tunisian government has been promoting a programme to control energy demand through solar water heaters with the Prosol funding mechanism. The programme has created a market for 50 suppliers, including seven manufacturers, and over 1,200 small installation businesses. However, only six companies produce, either partially or globally, the materials needed to manufacture solar water heaters.

The Prosol-Elec programme is part of the dynamic launched by Law 2009-7 of 9 February 2009, which was added to Law 2004-72 of 2 August 2004, authorizing self-production, with the right to sell the electricity generated, via the STEG. Between 2010 and 2012, a first phase aimed to cover 1,000 residential roofs and 1,500 kW installed. A second phase aimed at covering 8,000 roofs and 12,000 kW installed between 2012 and 2016.

Prosol and Prosol-Elec were not dynamic enough to bring about a national industrial policy that would allow the emergence of a renewable energy sector. More specifically, in the photovoltaic field, most of the companies in the sector are commercial companies that buy and resell photovoltaic cells imported from Asia. The Decree No. 1999/208 of 4 January 1999 made no distinction between local contractors who manufacture renewable equipment, for which there are no specific regulations, and the commercial companies that sell them. The import of materials for which ISO 9001 and ISO 14001 certification is not mandatory has encouraged unfair competition with locally manufactured products (Benalouache 2013).

TuNur: The objective of the TuNur project is to produce green electricity in Tunisia and export it to Europe. It seeks to revive the Desertec project, albeit on a smaller scale as it only involves Tunisia and Italy. The first stage of the project consists of a 250 MW CSP tower link to Europe by a 250 MW HVDC transmission line from Tunisia to Malta. The second phase will multiply tenfold the production capacities and the voltage of the grid. Once landed in Malta and Italy, power will be transported across Europe. The project is under negotiation. TuNur is a joint venture between Tunisian and UK solar companies which have the support of Tunisian and Maltese investors.

8 For more detail on the action, see the official blog: http://cemagas.org.

Tunisian Solar Plan: The Tunisian Solar Plan (TSP), originally formulated in 2009 and updated in 2012 (ANME 2012) and 2015, is the long-term plan launched by Tunisia to attract investment in renewable energy in the electricity sector. It constitutes is the operational tool for implementing the Tunisian strategy for electricity mix.

The TSP is based on two essential pillars: the improvement of energy efficiency and the use of renewable energies. The Plan seeks to achieve 30 per cent renewable energy in the energy mix by 2030. It predicts that 80 per cent of the funding will come from the private sector (Waissbein et al. 2014: 13). The TSP aims to reach an installed capacity of 3,725 MW in 2030. The programme is very ambitious as renewable power at the end of 2012 stood at about 250 MW, mainly wind power (245 MW) and Photovoltaic PV (5 MW).

Concerning energy efficiency in Tunisia, the TSP targeted short-term results over the period 2010–2016. The objective (not reached) was to create a renewable generation capacity of 1,000 MW in 2016, representing 11 per cent of total electricity generation and 16 per cent of total installed capacity. However, compared to neighbouring countries, such as Morocco, Tunisia has been slow to launch a programme to develop renewable energy. According to Rocher and Verdeil (2013: 278), this blocked transition is "the result not only of inadequate legal and financial tools to allow for the emergence of renewable energy but also of political values and choices" and shared interest between STEG management and the regime.

The legislative framework: In 2015, the Tunisian government created a new policy instrument to encourage private investment through a new law, which completed the two laws of 2004 and 2009.[9] This law seeks to encourage investment in renewable energy and sets a quantified target (30 per cent of renewable energy electricity that will represent 3,800 MW of total electricity production by 2030).

The Law 2009/07 already permitted self-production and the sale of renewable electricity to the STEG. Thus, private producers may sell their surplus to the STEG. Furthermore, the 2015 law extends self-producer status to local authorities, public enterprises and private companies and finally, the export of renewable energy becomes possible (French Embassy in Tunisia 2018).

Concerning the quality of governance, Tunisia obtained an "unsatisfactory" rating of 49/100 for the Resource Governance Index (RGI), which placed it 28th among 59 countries in 2014 (Mejri 2014: 38). The RGI Index, provided by the Revenue Watch Institute, assesses the governance of natural resources. As the Institute stated in 2014, "what is striking about Tunisia is the gap between well-developed oil legislation and the implementation of this legislation. Laws are generally sound but access to information on most aspects of the oil and gas sector remains

9 "The 2004 Energy Efficiency Law authorised energy companies producing electricity from co-generation to sell their production to the public utility STEG and transport it through the national grid. The present Law on Energy Efficiency widens this support framework by allowing any establishment, or group of establishments in the industry, agriculture and services, to produce electricity from energy saving co-generation or renewable energy, and to sell it to STEG". See IEA website: *Policies and Measures: Tunisia: Law 2009-7 on Energy Efficiency: Renewable Energy Provisions*, last updated 12 November 2013, https://www.iea.org/policiesandmeasures/pams/tunisia/name-24756-en.php.

very limited" (Mejri 2014: 35). This note positions Tunisia in a more or less "advanced" rank compared to other MENA countries, just behind Morocco.

To improve its ranking, Tunisia has launched reforms to support transparency and access to information. The Law Decree No. 2011-41 of 26 May 2011, on access to administrative documents of public bodies, allows the media and civil society to have access to information and to play an more active role in the field.

2.2.2 A New Vision for the Energy Sector

In 2013, a national public debate started in a context of rising oil prices: "What is the future of Tunisian energy?" There was a display of the power of civil society by associations, personalities from politics and experts in the field. The minister of industry supervised this debate in collaboration with the STEG, the ANME and different specialized companies, especially small and medium ones. The objective was to suggest an energy strategy by 2030, built on an analysis of the different resources of a country currently dominated by hydrocarbons.

In all, 27 debates were held, bringing together experts, institutions, researchers and representatives of professional institutions such as the Tunisian General Labour Union (*Union Générale Tunisienne du Travail*, UGTT) or the Tunisian Confederation of Industry, Trade and Handicrafts (*Union Tunisienne de l'Industrie, du Commerce et de l'Artisanat*, UTICA). A large part of the debates focused on the energy deficit and the subsidies on fossil energies, on the future energy mix and the transnational grid with Europe (Omri 2016: 169). The proposals resulting from these debates put the emphasis on the need to develop Tunisian renewable energy, to develop a national industrial market, to encourage local investment and to find an appropriate a solution to the growing subsidies.

The thorny issue of shale gas exploitation was also highlighted and accompanied by loud protest from civil society, which obtained wide exposure in the national press. In November 2014, some pro-environmental associations spoke out against what they consider as the first step towards shale gas production (Gallala 2014). However, at the beginning of 2017, the government launched an environmental impact study on shale gas that will be achieved in October 2018.[10] In this new approach to energy transition, civil society is demonstrating the importance of regional specificities in the development of the Tunisian energy strategy. For example, "Renewable energy has been an important part of the recent discussion and a major challenge of the upcoming 2017 election debate of the municipal elections in Tunisia" (Akermi and Triki 2017: 81). Indeed, in the Tunisian strategy, renewable energies take centre stage. The nuclear option is, however, not possible before 2030, due to technical, financial and security constraints but this solution remains under study. Regarding hydrocarbons, this debate has permitted proposals for revision of the Hydrocarbons Code, and a feasibility study for the use of coal and LNG.[11]

10 "Exploration du gaz de schiste: Vers l'optimisation des ressources conventionnelles", in *Le Temps*, 26 November 2017, http://www.letemps.com.tn/article/105746/exploration-du-gaz-de-schiste-vers-l'optimisation-des-ressources-conventionnelles.

11 This study commissioned by the World Bank suggested the use of coal (30 per cent) in the economic scenario along with renewable energy and gas. See Rekik et al. (2014).

At the end of this debate, the ANME agency released the document *Stratégie nationale de maîtrise de l'énergie* (ANME 2014), and presented Tunisia's energy strategy for 2030. The former document developed four axes:

1. The need for an energy transition. This section presents the energy situation of Tunisia as well as the constraints, highlighting the necessity for better energy management.
2. Principles and objectives of energy efficiency. This axis outlines the strategic framework for energy policy by 2030.
3. The Action Plan 2014–2020, which defines the policies and measures to be implemented in the short and medium term.
4. Recommendations for the success of this strategy, which presents the institutional, financial and socio-cultural measures necessary for the success of the transition.

It is important to notice that employment is almost not mentioned in the report. A single sentence indicates that the strategy should lead to the creation of 12,000 jobs by 2030 but without referring to any study (ANME 2014: 20). The policy presented in the document is quite disappointing. It consists of a series of intentions or vague objectives. For example:

> The objective of the action plan for 2014–2020 is to reverse the trajectory of demand. This is an ambitious investment programme that is divided into actions and concerns all sectors. Electricity use represents a priority target of the action plan to reduce the electrical demand in a substantial way. (ANME 2014: 18)

In the renewable energy sector in the MENA region, public–private partnership contracts seem to have become a new mode of public policy and management. The choice of a type of contract, or mode of financing, are political choices as well (Gerin-Jean 2018). In this way, the Tunisian government is now looking to promote foreign investment in the energy sector. Nevertheless, developing Tunisian energy production through renewables and domestic oil and gas requires certain reforms that have proven challenging to implement owing to the weight of energy subsidies in the economy as well as the STEG monopoly.

In a political landscape characterized by uncertainty and rapid change, renewable energy is not the only scenario on the table. To counter the decline in domestic production of gas, Tunisia could import more piped gas from Algeria or could build LNG regasification and storage infrastructure to import gas from the international market. A third solution proposed in the study by the World Bank's Energy Sector Management Assistance Programme (Rekik et al. 2014) may entail starting to import coal from the international market for electricity production. Another hypothesis is mentioned: opposite to the purposes of the TuNur project, rather than allowing Tunisia to export green electricity to Europe, the electricity interconnector to Sicily would allow Europe to export electricity to Tunisia.

To conclude this part, the energy sector in Tunisia is facing new challenges that require deep reforms. The growing deficit is not sustainable and the energy mix must include much more renewable energy. The government and civil society are involved in a difficult process which is only just beginning. Different visions, along with social protests (see below), are to some extent portraying a new governance of the system. More steps are needed to pave the way for a sound energy transition.

3. European Energy Policy in Tunisia Since the Launch of the Barcelona Process

3.1 European Energy Policy in Tunisia: A Missed Opportunity

Unifying the energy market of the European Union and the countries of the South of the Mediterranean is a goal that has been pursued for several decades.[12] Before the Mediterranean Solar Plan (2009) and the Union for the Mediterranean (UfM) (2008),[13] in 2007 the MEDA programme of the European Union started a project on "Progressive integration of the electricity markets of Algeria, Morocco and Tunisia into the internal electricity market of the European Union". At that time, Tunisia had timidly allowed private electricity generation.

Analysis on the making of tools and instruments for the Mediterranean Solar Plan highlights a mode of governance based on consensus and "expertification". The framing of the public policy for renewable energy was initiated by private and public actors and led to the diffusion of so-called "best practices" taking a market-oriented approach. The general ambition of the Mediterranean plan was to introduce more decentralized actors and market regulation in the production and distribution of electricity, and also to build the infrastructure to connect European and southern grids. Compelled by these actors and the former president Zine el-Abidine Ben Ali, the Tunisian solar energy market started to become institutionalized in 2009 with the Tunisian Solar Plan. The Plan was financed by the National Fund for Energy Efficiency (*Fonds National de Maitrise de l'Énergie*, FNME), the STEG, private funding and international cooperation funds.[14] The FNME was created in 2005 with the help of the French Agency for Development (*Agence Française de Développement*, AFD) and the World Fund for Environment.

This policy has gone through concurrent and international calls for tender, loans for economic development aid or climate change funds, and most recently contractual solutions such as public–private partnerships. The synergy between aid-to-development instruments and policies in favour of renewable energy has led to a transformation of the modes of government and the role of the state. The state is expected to become a judge that provides rules of the game instead of being the leading actor. The use of these aids to the development of private expertise instruments showed its first effects in 2017 with tender announcements in the wind and solar energy market for private funding and international cooperation funds.

The German international cooperation agency GIZ has supported Tunisian partners like the Ministry of Energy, Mines and Renewable Energies, the STEG, the ANME and other public and private actors in the sector. Since 2017 GIZ has been granting to Tunisia a donation of 7 million euro (17 million dinars) for help finance implementation of the Tunisian Solar Plan. This

12 For more detail about the history, see Gerin-Jean (2018).
13 The Union for the Mediterranean (UfM) is an intergovernmental organization of 43 countries from Europe and the Mediterranean Basin created in 2008: the 28 member states of the European Union and 15 Mediterranean partner countries from North Africa, the Middle East and Southeast Europe. See UfM website: *Member States*, https://ufmsecretariat.org/who-we-are/member-states.
14 See IEA website: *Policies and Measures: Tunisian Solar Plan (PST) 2010-2016*, last updated 19 April 2018, https://www.iea.org/policiesandmeasures/pams/tunisia/name-24755-en.php.

budget will finance technical and logistical support for the electricity production programme through renewable energies (2017–2020). Continuous training and support actions are offered to experts and managers of Tunisian institutions and the private companies concerned, to enable them to strengthen their skills. According to researchers, GIZ is playing a significant role in accompanying the reform of the energy sector:

> GIZ helped organize a seminar on self-production from renewable sources, which was important in crystallizing criticism of the regulatory framework and in condemning STEG's attitude toward private investors in the renewable energy sector […]. German cooperation in Tunisia was significantly reinforced in the late 2000s as part of a policy to promote the export of specialized industries in the energy sector (in which German firms are known to excel). (Rocher and Verdeil 2013: 288)

Furthermore, Tunisia is also destined to be part of the Desertec super-grid which aims to develop solar energy in the desert and connects several African and European countries, when and if this project is implemented. Desertec Foundation was created in 2009 as a non-profit organization by a network of scientists, politicians and economists. Founding members come from the German Association of the Club of Rome.[15] Their concept is to meet the global energy demand as much as possible thanks to the renewable energies produced in the deserts. The Desertec Industrial Initiative (DII) is an industrial consortium that aims to develop utility-scale renewable energy projects in MENA desert areas and build interconnection power systems between Africa and Europe.[16] Desertec Foundation endorses the TuNur project, whereas DII is a partner of ACWA Power, the company developing the Moroccan mega solar plant at Ouarzazate.

This concept of the exportation of renewable energy across the Mediterranean area has served to crystallize the differences of opinion and conflicting interests. Mansour Cherni, a Tunisian trade unionist, expressed serious concerns during the 2013 World Social Forum in Tunis, asking, "Where will the energy produced here be used?... Where will the water come from that will cool the solar power plants? And what do the locals get from it all?" (Hamouchene 2015). The analysis of Hamza Hamouchene, co-founder of Algeria Solidarity Campaign, is very critical of projects like TuNur, which "deny local people control and access to their land, rob them of resources and concentrate the value created in the hands of domestic and foreign predatory elites and private companies" (Hamouchene 2017).

As it happened, the ministerial meeting of December 2013 led to the end of the Mediterranean Solar Plan, since the European and Tunisian ministers did not manage to sign an agreement. The lack of unanimity on the master plan is the result of Spanish opposition based on Article 9 of Directive 2009/28/EC, which allowed the European member states to achieve their objectives in renewable energy through the importing of green electricity from southern Mediterranean countries. Even if the STEG and the Tunisian government have so far rejected the DII proposal, the TuNur Company recently submitted a new project to the Tunisian government for approval of a 4.5 gigawatt (GW) solar park located in the Sahara desert, for electricity export to Europe using submarine cables. The TuNur and Desertec projects are thus

15 See Desertec website: *About the Desertec-Foundation*, http://www.desertec.org/about-desertec.
16 See DII website: A*bout Dii*, https://dii-desertenergy.org/?p=3634.

challenging the monopolistic position of the STEG.

Furthermore, on 23 May 2012 Tunisia signed several international agreements that cover areas from business integrity to international investment and green growth. In particular, Tunisia adhered to the following OECD instruments: (a) Declaration on International Investment and Multinational Enterprises; (b) Declaration on Propriety, Integrity, Transparency in the Conduct of International Business and Finance; and (c) Declaration on Green Growth (ECORYS 2013, OECD 2012). In this sense and following several local social protests, Tunisia has also taken steps to integrate the Extractive Industries Transparency Initiative, which advocates a global standard for open and accountable management of extractive resources. Protests denouncing state mismanagement of natural resources began in 2012 when Tunisia's audit court claimed that the state did not carefully oversee the process of foreign concessions in the hydrocarbon sector. Since then, numerous protests asking for transparency in the state energy policies, job creation in both the petrol sector and green economy, and renegotiation with foreign companies in the hydrocarbon sector under fair conditions, have spread in the poor regions of the country (Aliriza 2017).

3.2 EU Energy Projects in Tunisia

Despite the engagement of the European Union to back up the energy transition in Tunisia, the currents projects remain very modest. Until now energy accounts for a peripheral part of European aid to Tunisia. It is confined to three Neighbourhood Investment facilities: 1.5 million euro for construction of the photovoltaic power station in Tozeur, 15 million for the power station of Nabeul (both under construction); and 13.2 million for SUNREF support (European Commission 2016: 22). No critical analysis in the academic literature on these projects is available; documents are mainly descriptive.

The SUNREF project in Tunisia: SUNREF (Sustainable Use of Natural Resources and Energy Finance) is the green label of the AFD. It aims to promote industrial investments in energy efficiency and depollution. SUNREF facilitates access to sustainable energy in order to develop an abstemious carbon economy. It is financed by the AFD with contributions from European Bank for Reconstruction and Development (EBRD) and the European Investment Bank. The facility helps the associated Tunisian financial institutions (*Banque Internationale Arabe de Tunisie*–BIAT and *Union Bancaire pour le Commerce et l'Industrie*–UBCI) to give loans to SMEs for investments in energy efficiency, cleaner production and renewable energy.

In the first phase (2009–2012), a facility of 40 million euro was concluded in partnership with two Tunisian banks (UBCI and BIAT). The second phase (SUNREF 2) focuses on SMEs and the private sector, and concerns depollution and energy management. In 2017, the EU agreed to support the programme with a 13.2 million euro through the Neighbourhood Investment Facility (SUNREF 2017).

The EU supports the programme by reducing the interest rate by 2 per cent with a 13.5 million credit line, as well as by providing technical assistance. The programme concerned investments in 8 energy projects (2.1 million on average). Regarding the project's results, the only available assessment is provided by AFD, which states that the first phase of the project allowed 540 gigawatt hours (GWh) of energy saving, a reduction of 110,000 tons of CO2 per year (Ben Naceur 2017: 16).

The Tozeur power station: The Tozeur photovoltaic power station (10 MW) is financed by KfW, the German Development Bank. It lent 12.5 million euro to the STEG for construction of the power station. The Italian company TerniEnergia won the bid. The loan is supported by the EU with a Neighbourhood Investment Facility reaching 1.35 million euro during the period 2016–2018. The plant is under construction.

Support of the EBRD to the STEG: EBRD supports the STEG for its Network Equipment Programme included in the 12th five-year Socio-economic Development Plan (2012–2016). The EBRD has provided a senior loan with a sovereign guarantee that accounts for 46.5 million euro. The project aims at improving the quality of the grid.

4. A Bottom-up Perspective on the Energy Sector in Tunisia

4.1 Content Analysis of the Documents Produced by Relevant Stakeholders

Documents provided by the selected stakeholders in Tunisia were very limited. This was true for administrative bodies as well as administration involved in energy-related issues. Most of the documents were provided by the think-tanks, which have published reports or analyses on the energy sector in Tunisia. Concerning assessment of the EU energy policy in Tunisia, as mentioned above, the scarcity of documents is even more pronounced.

A Tunisian think-thank – the Tunisian Institute for Strategic Studies (*Institut Tunisien des Etudes Stratégiques*, ITES) – has been interested in the energy sector for many years. In the past it has published several studies on the energy prospective, such as *Energie 21* in 1998 and *Tunisie 2030* in 2003. Two of its documents on energy were published more recently. The first one, *Les enseignements des expériences internationales pour la maîtrise de l'énergie et le nouveau rôle de l'État* (ITES 2017), stresses the potential of energy efficiency in Tunisia. It reiterates its importance for developed countries, which have already achieved significant progress in that field, and recommends that Tunisia should embark on the same path. The main conclusions of the report are that Tunisia needs a global vision based on innovation in technologies; and that the state should play a new role by increasing its regulation action and support investments in the sector.

The second report, *Énergie 2025* (El Haddad 2016), provides a worrying assessment of the energy sector in Tunisia especially after the revolution (see Table 6). It points out the problem of the deficit mentioned above.

Table 6 | Evolution of the energy mix

	1995	2000	2005	2010	2015
National production (Mtoe)	4.6	5.7	5.6	7.3	4.9
Consumption (Mtoe)	5.3	6.7	7.4	8.5	9.4
Energy budget (Mtoe)	0.1	0.2	-1.6	-0.6	-4.2
Energy independence (%)	102	103	92	93	55
Balance of foreign trade of energy (million dinars)	-74	-220	-511	-483	-3,390

Source: El Haddad (2016: 12).

In 2015 the national production of energy reached the level it had held in 1995, having experienced a severe decrease since 2010. For ITES, the Tunisian policy in the period 2011–2015 was not able to respond to the following challenges: energy deficit, growing subvention, contraband from Libya and reduction of investments. The fact that five Ministers of Energy succeeded each other during the period did not help to implement a long-term policy.

The 2016 ITES report establishes three scenarios; but even the most optimistic shows a deficit (see Table 7).

Table 7 | Prospective scenarios for the future of energy in Tunisia

	Low	Intermediate	Desirable
GDP (rate of growth, %)	+2.1	+4.4	+6.0
Energy intensity (rate of growth, %)	-0.4	-0.4	-2.0
Energy demand (rate of growth, %)	+1.7	+4.0	+4.0
Energy demand in 2025 (Mtoe)	11.1	13.9	13.9
National production of hydrocarbons (Mtoe)	2.3	6.7	8.5
National production of RE (except wood) (Mtoe)	0.1	0.2	2.0
Fiscal gas paid by Algeria for gas transport to Europe (Mtoe)	0.3	1.2	1.2
Total energy availability (Mtoe)	2.7	8.1	11.7
Energy budget in 2015 (Mtoe)	-7.8	-4.6	-1.0
Energy dependency rate (%)	76	42	

Source: El Haddad (2016: 31).

According to the report, the prerequisites for setting up the most advantageous scenario are: (i) restoring security in the region and on the national territory; (ii) establishing a climate of trust with investors; (iii) bringing the existing texts in line with Article 13 of the Constitution; (iv) reorganization of the sector in the direction of greater transparency and the empowerment of operators; (v) an adjustment of the fiscal framework favouring the development of fossil and renewable national resources, conventional and unconventional; (vi) promulgation of the implementing legislation of Law No. 2015-12 relative to electricity production from renewable energies; and (vii) an acceleration of the energy efficiency policy.

The main strategic orientation must involve the construction of a shared vision in a profoundly changing environment. Tunisia has moved from an exporting country to a structurally importing country, hence the new question of its energy security. The report insists on control of energy demand, valorisation of the wind, diversification of energy suppliers – especially for natural gas and electricity – by reinforcement of transport infrastructures, and the reform of the energy pricing system with a view to gradually reducing subsidies and tariff distortions between products. Finally, improving governance through transparent and responsible management of the sector is seen as a key step. The report also advocates the development of shale gas – which however is rejected by Tunisian civil society organizations as witnessed in the STOP Campaign.

The sector of energy is subjected to strong criticism from the citizens in the south of Tunisia. Since the revolution, sporadic but recurrent protests, sit-ins and demonstrations are organized especially in the south region of Tataouine.[17] For example, in May 2017, the Al-Kamour protest camp succeeded in stopping the transport of hydrocarbon resources.[18] The demonstrators asked for a greater share of the local resources, sound regional development programmes and also job creation. After a negotiation with the government, the protesters responded to the government's offer by claiming 1,500 jobs in the petrol sector, 2,000 jobs in environment and park projects, and a regional development fund of 100 million dinars (Aliriza 2017).

The social media campaign "*winou el-petrol*" launched in 2015 questions who profits from Tunisia's mineral resources. It expresses the frustration and more generally the grievances of a large part of the population, who consider that they don't benefit from the natural resources of the country or who are disappointed by the economic situation. This campaign was denounced as a manipulation and a political manoeuvre by the magazine *Leaders*.[19] It did however shed light on the question of social justice, which is the major issue on which the numerous demonstrations and protests in Tunisia converge.

4.2 Analysis of the Recursive Multi-Stakeholder Consultations

Due to the weakness of the intervention of the EU in the energy field in Tunisia and the monopoly mindset of the sector as discussed above, we had very few sound responses concerning the research questions of the MEDRESET project, particularly on how the targeted stakeholders assess European policies in the Mediterranean in the field of energy. While most of the answers stated the importance of Europe, they regretted its low level of involvement in Tunisia. As a result, most of the answers were mainly expectations on how to drive the future fields of EU–Tunisian cooperation.

Europe is commonly seen as an important stakeholder to solve the different challenges of Tunisia concerning energy. This is particularly true for both the diversification of suppliers (importance of the EU–Tunisian electric grid) but also to boost the RE sector.

17 "Tunisie: dans le sud, des manifestants ferment une installation pétrolière", in *RFI Afrique*, 21 May 2017, http://rfi.my/1DYU.T.
18 "Pétrole: Des pertes de 400 MD à cause des protestations à Tataouine", in *Webdo*, 31 May 2017, http://www.webdo.tn/?p=158403.
19 See supplement to *Leaders*, No. 50 (2017), p. 7.

Coherence of EU policy and of member states' projects: Public stakeholders (Interviewees 6, 8) suggest to better articulate both the policies of the EU and those of the member states. Concerning electricity, Germany is very active and efficient in supporting the solar sector. Italy is also involved, for example in the Tozeur power station. France supports energy with the SUNREF programme of the AFD. But instead of defending each Member State's own interests, the EU should help to build a global vision in which actors could insert their strategy (Interviewee 4). In a first phase, the EU could help the Tunisian government to climb out of a period of instability concerning energy and to launch a sound prospective for the next decade (Interviewee 6). Then different instruments could be mobilized to realize the strategy and bring on board all internal and international actors (see below for more detail).

Progressive reduction of subsidies in energy the sector without threatening social equilibrium or putting pressure on the most vulnerable households: A representative of a Tunisian think-tank pointed out the sensitive aspects of energy subsidy reform (Interviewee 5). This is a delicate move for the government, especially in a post-revolutionary context and post-economic crisis – a time of great expectation for a better life. Research shows how the rise of electricity prices could lead to increased local poverty[20] if governments do not implement social policies at the same time. However, for an NGO activist (Interviewee 9), another obstacle to the energy subsidy reform seems to be the dominant benefit from this subsidy for powerful players such as energy-intensive industries and businesses. The think-tanks and the public stakeholders (Interviewees 9, 11, 13) are aware that the increase in energy subsidies is not sustainable and that a reform of the price mechanism as well as a better connection between internal and international prices of energy should be implemented.

Support for small-scale renewable energy projects: One of the interviewed NGOs (Interviewee 16) insisted on an interesting point. Tunisia is currently facing a severe challenge, namely the urgent need to accelerate the transition process and to contain its energy deficit. The governance issues that explain the slow start of the Mediterranean Solar Plan are directly linked to the choice of centralized production in the major solar projects in the Mediterranean. Renewable energies in the context of Euro-Mediterranean partnership are based for the NGO (Interviewee 16) on the centralized model of northern countries, even though smaller solutions could be replicated. Alternative models will need to be developed to respond to the demand of a new strategy for the energy sector. Climate change, energy price, corruption and pollution are serious issues which involve both high expectations and risk of potential social mobilization about the energy sector, but also a strong opportunity for the inseparable emergence of initiatives by the grassroots associations and citizens.

Technical assistance and capacity building in renewable energy: The NGOs (Interviewees 16, 9) and the think-tanks (Interviewees 7, 12) mentioned that the renewable energy sector represents one of the only solutions to respond to the huge demand for energy that will occur in the next decades, and to limit the emission of greenhouse gas. Tunisia has a high potential for renewable energies both wind and solar. This potential must be developed in the future and requires large investments and also technology transfers. Tunisia does not yet

20 According to an analysis of the fiscal and distributive consequences of the changes to the subsidy setup announced by the government at the end of 2014, raising subsidies for consumers and removing subsidies for other energy sources would lead to a short-term increase in the poverty rate of 2.5 per cent (Cuesta et al. 2015).

have a consistent sector that would enable a sound response to this challenge. Tunisia needs competencies, engineering and a strong tissue of start-ups, small companies and big industries. The development of a renewable energy sector would be a win-win process for Tunisia and Europe if a long-term industrial strategy can be commonly established (Interviewee 12).

HVDC line between Tunisia and Italy: For the international organization (Interviewees 15, 17), the lack of a high-voltage direct current (HVDC) grid between Europe and the south Mediterranean shore remains one of the biggest obstacles to an integrated Euro-Mediterranean electricity market. The project of a HVDC line between Tunisia and Italy could help to both export green energy from the south when large solar infrastructures are installed in Tunisia and also to import electricity from Europe. HVDC is necessary to avoid loss of power over such a long distance. This would also be a way to be less dependent on Algeria (Interviewee 15).

Investment climate in the energy sector: For an actor of the private sector (Interviewee 11), even if Tunisia improves its legal framework to open the production of electricity to private companies, many things would need to be done to complete the liberalization of the energy market. In the energy sector, investors are particularly sensitive to the business climate and regulatory security (Interviewee 8). The relative instability of the political scene may discourage investors (Interviewee 8). For private companies and the professional syndicate that represents them, Tunisia should open the market to households by implementing a feed-in tariff allowing them to sell electricity surpluses on the grid (Interviewee 8). Another possibility is to accept peer-to-peer contracts between consumers (factories, hospitals, municipalities) and producers (Interviewee 11).

The importance of energy efficiency: For public and private actors (Interviewees 4, 13, 10, 11), energy efficiency is one of the main ways to address climate change. The buildings in Tunisia are poorly insulated and need heating in the winter and air conditioning during the summer. Improving the thermal characteristics of the buildings by having proper insulation could easily save 20 to 30 per cent of energy consumption. Improved lighting and using compact fluorescent light bulbs also reduces the electric load (Interviewee 4). For an NGO, traditional ways of building such as adobe still exist in Tunisia and energy efficiency policies could also safeguard this traditional know-how (Interviewee 9).

Mitigating risks to boost private investment: For an international organization (Interviewee 17), one of the most useful instruments would be to reduce the high cost of investment due to risk. Investing in public policy measures to mitigate risk is the best way to achieve meaningful direct savings. Instead of investing in renewable energy at higher production costs, priority should be given to public risk mitigation measures, which allow investments to be made at low cost.

4.3 Employment and Gender-related Issues

We asked the stakeholders for their views on the gender dimensions of the EU energy policy in Tunisia. No answer was given. Even concerning the less limited gender–energy nexus, we were not able to collect much by way of solid responses or references to existing studies. A pro-women NGO was aware of the importance of the subject but had hardly anything to say on this issue (Interviewee 9). Gender issues are not really a matter of interest for the EU programme concerning energy or generally speaking for the energy sector. The relations between gender and energy will need further investigation in order to fuel the EU energy policy.

Much information on gender issues can be found in the gender report of the National Institute of Statistics (INS 2016), but it is symptomatic that the term "energy" occurs only once. We didn't encounter any energy programme that included a gender dimension. The conclusion of the 2017 report made by GIZ on gender and energy in Morocco is also valid for Tunisia:

> What is the gender dimension of the problems identified in the energy sector? What are the gaps between women and men in relation to the sector? What are the causes? To what extent do these inequalities affect the actions of the sector? All these questions are currently unanswered, but these answers are a prerequisite to know the specific and differentiated needs of women/girls and men/boys in relation to the energy sector. (Labani Motlagh 2017: 6)

As far as employment in the energy sector is concerned, we did not find a lot of information. The interviewed stakeholders did not have much to share on this issue. One of the cited reasons was the lack of information and data. The second reason was that the STEG is a public company that already has a large pool of employees, which can respond to the emerging RE sector. Energy is not seen as a sector that is about to significantly reduce unemployment.

The Ministry of Vocational Training and Employment publishes sectorial studies on employment, but they do not cover all sectors and are not up to date. Moreover, data on employment combine energy with the mining industry, making it difficult to ascertain numbers for employment in the energy sector. According to the few available statistics, the share of female employment in mines and energy only amounts to 4,900 people, which is very low and represents only 1 per cent of the female jobs in services in 2012 (ONEQ 2013: 24).

In a report focusing on employment, GIZ establishes that renewable energy and energy efficiency will generate additional jobs for between 7,000 to 20,000 people from 2012 to the year 2030 (Lehr et al. 2012: 4).

Conclusion

Tunisia faces a massive change in the attributes of its energy system, in a time of uncertainty due to the 2011 revolution and the subsequent political instability. Autonomous until the revolution, Tunisia became a dependent country with a growing energetic deficit. Due to the revolution context, the possibility of establishing a stable energy policy did not exist. Smuggling and illegal trade with Libya increased, while energy subsidies reached 7 per cent of GDP. But Tunisia also had an interesting experience with renewable energy through the Prosol programme, which promoted individual solar heating.

Despite the engagement of the European Union to support the energy transition in Tunisia, the currents projects remain modest. Energy accounts for a peripheral part of European aid towards Tunisia. It is confined to three Neighbourhood Investment facilities: 1.5 million euro for construction of the photovoltaic power station in Tozeur and 15 million for the Nabeul power station of (both under construction); and 15 million for SUNREF support.

Because of the absence of sound energy policy in Tunisia and the limited policy of the EU on this aspect, the stakeholders interviewed in the framework of the study focused mainly on the

potentialities of cooperation and the importance of the energy sector in the future. Coherence between the policy of the EU and the other donors, support to small-scale projects, aid to integrate the electricity market, and mainly more EU funds constitute the actions expected of the Union.

The main recommendations or ideas provided by the grassroots stakeholders are the following. EU should support these objectives:

- Harmonize EU policy and the projects of the member states.
- Implement progressive reduction of subsidies in the energy sector without threatening social equilibrium or putting pressure on the most vulnerable households.
- Develop small-scale renewable energy projects as well "big" power stations
- Increase technical assistance and capacity building in renewable energy
- HVDC line between Tunisia and Italy is important to build a Euro-Mediterranean electricity market.
- Improve the investment climate in energy sector
- Develop the potential of energy efficiency
- Mitigate risks to boost private investment

Alongside the results from the interviews, it is important not to ignore the many social protests that have emerged in Tunisia over the last years around the energy sector, claiming a fair distribution of natural resources, respect for environment, transparent management and job creation. Concerning gender issues, their almost complete neglect by all actors involved in the energy sector, from policy makers to the private sector, signals the urgent need for making this sector more gender sensitive.

References

Abid, Amal and Anthony Dos Reis (2017), "Energy Strategies and Policies in North Africa: Tunisia, the Pursuit of Energy Independence", in *BearingPoint*, 27 April, https://www.bearingpoint.com/fr-fr/blogs/blog-energie/energy-strategies-and-policies-in-north-africa-tunisia-the-pursuit-of-energy-independence

Akermi, Raja and Abdelfattah Triki (2017), "The Green Energy Transition and Civil Society in Tunisia: Actions, Motivations and Barriers", in *Energy Procedia*, Vol. 136 (October), p. 79-84, https://doi.org/10.1016/j.egypro.2017.10.288

Aliriza, Fadil (2017), "Years of Tunisian Protests Converge into One Demand: Economic Justice", in *Middle East Eye*, 18 May, https://www.middleeasteye.net/node/63358

ANME–Agence Nationale de la Maîtrise de l'Energie (2012), *Nouvelle version du plan solaire tunisien. Programmation, conditions et moyens de la mise en oeuvre*, April, http://www.anme.nat.tn/fileadmin/user1/doc/DEP/Rapport_final__PST.pdf

ANME (2014), *Stratégie nationale de maîtrise de l'énergie. Objectifs, moyens et enjeux*, June, https://www.giz.de/en/downloads/giz2014-fr-strategie-energie-tunisie.pdf

Benalouache, Nadia (2013), "Une mise à l'épreuve des politiques énergétiques tunisiennes: diffusions et territorialisation de l'usage domestique de l'énergie solaire en milieu urbain", in *Environnement Urbain/Urban Environment*, Vol. 7 (September), https://eue.revues.org/425

Ben Naceur, Wided (2017), *SUNREF*, AFD presentation at the AHK seminar L'énergie éolienne en Tunisie, Tunis, 19 September, http://tunesien.ahk.de/fileadmin/ahk_tunesien/02_DE_International/Energie___Umwelt/EEE2017/Praesi/13_Ben_Naceur_SUNREF.pdf

Bennasr, Ali and Éric Verdeil (2014), "An 'Arab Spring' for Corporatization? Tunisia's National Electricity Company (STEG)", in David McDonald, ed., *Rethinking Corporatization and Public Services in the Global South*, London, Zed Books, p. 88-106, https://halshs.archives-ouvertes.fr/halshs-00976779

Business France (2017), *Tunisie – Secteur Énergétique: Bilan 2016*, 27 February, https://www.businessfrance.fr/tunisie-secteur-energetique-bilan-2016

Cherif, Moëz and Sameh Mobarek (2016), "Tunisia Faces Tough Strategic Choices As Demand for Energy Begins to Outstrip Supply", in *Voices and Views: Middle East and North Africa*, 19 January, http://blogs.worldbank.org/arabvoices/node/2220

Cuesta, José, Abdelrahmen El-Lahga, and Gabriel Lara Ibarra (2015), "The Socioeconomic Impacts of Energy Reform in Tunisia: A Simulation Approach", in *World Bank Policy Research Working Papers*, No. 7312 (June), http://hdl.handle.net/10986/22186

ECORYS (2013), *Trade Sustainability Impact Assessment in Support of Negotiations of a DCFTA between the EU and Tunisia. Final Report*, Rotterdam, ECORYS, 25 November, http://trade.ec.europa.eu/doclib/html/151923.htm

Eibl, Ferdinand (2017), "The Political Economy of Energy Subsidies in Egypt and Tunisia: The Untold Story", in *OIES Papers*, No. SP 38 (August), https://www.oxfordenergy.org/?p=30556

El Haddad, Mustapha et al. (2016), "Énergie 2025", in *Cahier de l'ITES*, No. 2

European Commission (2016), *Neighbourhood Investment Facility. Operational Annual Report 2015*, Luxembourg, Publications Office of the European Union, https://publications.europa.eu/en/publication-detail/-/publication/f38cba19-184b-11e8-ac73-01aa75ed71a1

European Community and Tunisia (2005), *Euro-Mediterranean Agreement establishing an association between the European Communities and their Member States, of the one part, and the Republic of Tunisia, of the other part*, OJ L 278, 21.10.2005, https://eur-lex.europa.eu/legal-content/en/TXT/?uri=celex:21998A0330(01)

French Embassy in Tunisia (2018), *Le secteur des énergies renouvelables en Tunisie*, January, https://www.tresor.economie.gouv.fr/Articles/2018/01/26/le-secteur-des-energies-renouvelables-en-tunisie

Gallala, Wissam (2014), "Projet de Gaz de Schiste en Tunisie: La société civile se mobilise!", in *Heinrich Böll Stiftung Afrique du Nord Articles*, 5 November, https://tn.boell.org/fr/node/433

Galtier, Mathieu (2017), "Pétrole et gaz en Tunisie: la fin d'une époque opaque?", in *Libération*, 20 July, https://www.liberation.fr/planete/2017/07/20/petrole-et-gaz-en-tunisie-la-fin-d-une-epoque-opaque_1584216

Gerin-Jean, Marie (2018), *Bureaucratisation néolibérale dans le développement: La gouvernance des partenariats public-privé Euro-Méditerranéens pour les énergies renouvelables au Maroc*, Thesis, Pantheon-Sorbonne University

Hamouchene, Hamza (2015), "Desertec: The Renewable Energy Grab?", in *New Internationalist*, 15 March, https://newint.org/node/26460

Hamouchene, Hamza (2017), "Another Case of Energy Colonialism: Tunisia's Tunur Solar Project", in *openDemocracy*, 9 September, https://www.opendemocracy.net/node/113256

IEA–International Energy Agency (2017a), *Energy Production - Tunisia*, https://www.iea.org/stats/WebGraphs/TUNISIA3.pdf

IEA (2017b), *Share of Total Primary Energy Supply in 2015 - Tunisia*, https://www.iea.org/stats/WebGraphs/TUNISIA4.pdf

INS–National Institute of Statistics (2016), *Rapport national genre Tunisie 2015*, April, http://www.ins.tn/fr/node/3123

IPCC–Intergovernmental Panel on Climate Change (2014), *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Geneva, IPCC, https://www.ipcc.ch/report/ar5/syr

ITES–Institut Tunisien des Etudes Stratégiques (2017), *Les enseignements des expériences internationales pour la maîtrise de l'énergie et le nouveau rôle de l'État*, January

Krimi, Khémaies (2018), "Energie: la Tunisie serait elle obligée d'importer son électricité d'Italie?", in *Kapitalis*, 14 February, http://kapitalis.com/tunisie/2018/02/14/energie-tunisie-serait-obligee-dimporter-electricite-ditalie

Labani Motlagh, Sepideh (2017), *Rapport Genre et Énergie*, GIZ Maroc, July, http://www.abhatoo.net.ma/content/download/57585/1238809/version/1/file/RAPPORT+GENRE+ET+ÉNERGIE.pdf

Lechtenböhmer, Stefan et al. (2012), *Etude stratégique du mix energétique pour la production d'electricité en Tunisie. Rapport final*, Wuppertal/Tunis, Wuppertal Institut and Alcor, https://nbn-resolving.org/urn:nbn:de:bsz:wup4-opus-47850

Lehr, Ulrike et al. (2012), *Renewable Energy and Energy Efficiency in Tunisia: Employment, Qualification and Economic Effects*, Tunis, GIZ, December, https://www.giz.de/expertise/downloads/giz2012-en-employment-renewable-energy-tunisia.pdf

Mejri, Kais (2014), "Vers plus de transparence dans la gouvernance des hydrocarbures en Tunisie", in *L'énergie*, No. 89 (August), p. 34-41, http://www.tunisieindustrie.gov.tn/upload/download/revue_energie/revue-energie-dec2014-fr.pdf

Ministry of Energy (2018), *Bilan national de l'energie de la Tunisie pour 2016*, March, http://catalog.industrie.gov.tn/dataset/bilan-national-de-l-energie-2016

Moisseron, Jean-Yves et al. (2017), "Assessing EU-Mediterranean Policies in the Fields of Industry and Energy from a bottom-up Perspective", in *MEDRESET Methodology and Concept Papers*, No. 8 (October), http://www.medreset.eu/?p=13461

OECD–Organization for Economic Co-operation and Development (2012), *Tunisia and Morocco Join Multilateral Business Integrity and Green Growth Instruments*, 23 May, http://www.oecd.org/countries/tunisia/tunisiaandmoroccojoinmultilateralbusinessintegrityandgreengrowthinstruments.htm

Omri, Amna (2016), *Analyse de la transition vers les énergies renouvelables en Tunisie: Risques, enjeux et stratégies à adopter*, Thesis, Université Côte d'Azur, Nice, https://tel.archives-ouvertes.fr/tel-01448219

ONEQ–Observatoire national de l'emploi et des qualifications (2013), *Le marché du travail en Tunisie*, November, http://www.emploi.gov.tn/uploads/tx_elypublication/Rapport_annuel_decembre_2013.pdf

Oxford Business Group (2017a), "Interview: Saïd Mazigh", in *The Report: Tunisia 2017*, https://oxfordbusinessgroup.com/node/921223

Oxford Business Group (2017b), *Tunisia Pushes 4.5-GW Solar Project Forward*, 12 September, https://oxfordbusinessgroup.com/node/926773

Rekik, Kemal et al. (2014), "Une vision stratégique pour le secteur Tunisien de l'énergie: réflexion sur des thèmes prioritaires", in *World Bank MENA Energy Series*, No. 88965, http://documents.worldbank.org/curated/en/587691468166165626

Rocher, Laurence and Éric Verdeil (2013), "Energy Transition and Revolution in Tunisia: Politics and Spatiality", in *The Arab World Geographer*, Vol. 16, No. 3, p. 267-298, https://hal.archives-ouvertes.fr/hal-01078983

SUNREF (2017), *SUNREF Tunisie: signature d'une ligne de crédit verte de 15 millions d'euros avec UBCI*, 20 February, https://www.sunref.org/sunref-tunisie-signature-dune-ligne-de-credit-verte-de-15-millions-deuros-avec-ubci

Tiss, Mohsen (2015), "Bizerte – Création du Forum méditerranéen contre le fracking et le gaz de schiste", in *L'Economiste Maghrébin*, 15 May, https://www.leconomistemaghrebin.com/2015/05/15/bizerte-creation-du-forum-mediterraneen-contre-le-fracking-et-le-gaz-de-schiste

Trabacchi, Chiara, Valerio Micale and Gianleo Frisari (2012), "San Giorgio Group Case Study: Prosol Tunisia", in *CPI Reports*, June, https://climatepolicyinitiative.org/?p=3480

Waissbein, Oliver, Sanju Deenapanray and Robert Kelly (2014), *Tunisia: Derisking Renewable Energy Investment. Selecting Public Instruments to Promote Renewable Energy Investment for the Tunisian Solar Plan NAMA*, New York/Tunis, United Nations Development Programme (UNDP), December, http://www.undp.org/content/undp/en/home/librarypage/environment-energy/low_emission_climateresilientdevelopment/derisking-renewable-energy-investment/drei-tunisia.html

Annex 1: List of Interviews

First Round of Interviews (face-to-face, Tunis)

Interviewee 1. Private sector, female representative, 10 July 2017, by Khaled Guesmi

Interviewee 2. NGO, male representative, 10 July 2017, by Khaled Guesmi

Interviewee 3. NGO, female representative, 11 July 2017, by Khaled Guesmi

Interviewee 4. Public sector, male representative, 12 July 2017, by Khaled Guesmi

Interviewee 5. Think-tank, female representative, 12 July 2017, by Khaled Guesmi

Interviewee 6. Public sector, male representative, 13 July 2017, Khaled Guesmi

Interviewee 7. Think-tank, male representative, 2 October 2017, by Jean-Yves Moisseron

Interviewee 8. Public sector, male representative, 2 October 2017, by Jean-Yves Moisseron

Interviewee 9. NGO, female representative, 2 October 2017, by Jean-Yves Moisseron

Interviewee 10. Private sector, male representative, 3 October 2017, by Khaled Guesmi

Interviewee 11. Private sector, female representative, 3 October 2017, by Jean-Yves Moisseron

Interviewee 12. Think-tank, male representative, 3 October 2017, by Jean-Yves Moisseron and Khaled Guesmi

Interviewee 13. Public sector, male representative, 3 October 2017, by Jean-Yves Moisseron

Interviewee 14. International organization, male representative, 4 October 2017, by Jean-Yves Moisseron

Interviewee 15. International organization, male representative, 4 October 2017, by Jean-Yves Moisseron

Interviewee 16. NGO, male representative, 4 October 2017, by Jean-Yves Moisseron

Interviewee 17. International organization, male representative, 4 October 2017, by Jean-Yves Moisseron

Second Round of Interviews (phone, by Jean-Yves Moisseron)

Interviewee 3. NGO, female representative, 9 January 2018

Interviewee 7. Think-tank, male representative, 9 January 2018

Interviewee 9. NGO, female representative, 11 January 2018

Interviewee 16. NGO, male representative, 11 January 2018

Annex 2: Questionnaire

1) What are in your view the main policy issues in the Mediterranean space regarding energy?

2) What are in your view the main policy priorities regarding energy?

3) What are in your view the main causes and most relevant factors and actors influencing these policy issues?

4) How do you evaluate existing policy solutions to these issues and would you suggest alternative policy responses to them?

5) What are in your view the most relevant policies/initiatives/practices/instruments of the EU and/or EU member states relating to energy issues that you have previously identified?

6) How do you evaluate these policies?

7) How do they affect men and women differently? What are, in your view, the important relations between energy and gender to be addressed?

8) How would you suggest the EU to redraft/change these policies?

9) Which other policies are important and how do you evaluate them?

10) How do you evaluate the effectiveness of EU policies in light of the actions of other actors?

MED RESET

مِد ريست

Istituto Affari Internazionali (IAI)
Via Angelo Brunetti 9
I-00186 Roma

Tel. +39-063224360
Fax +39-063224363

iai@iai.it | www.iai.it

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