



Figure 1: Energy profile of Tunisia



Figure 2: Total energy production, (ktoe)

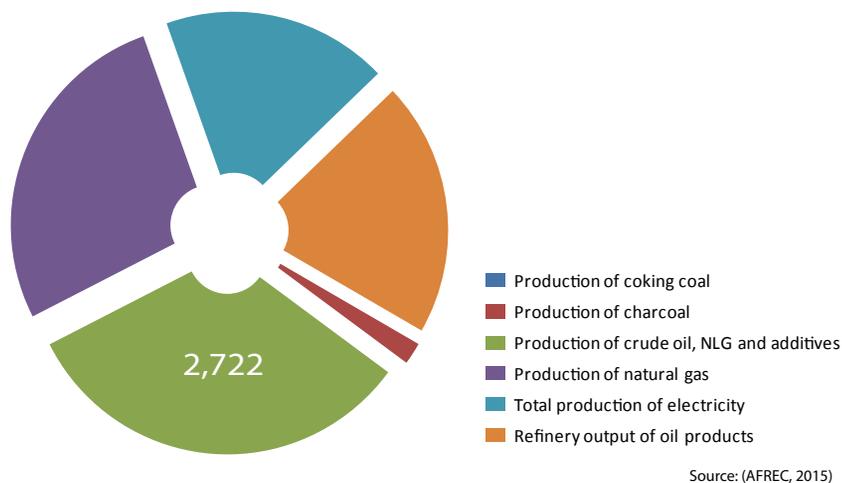
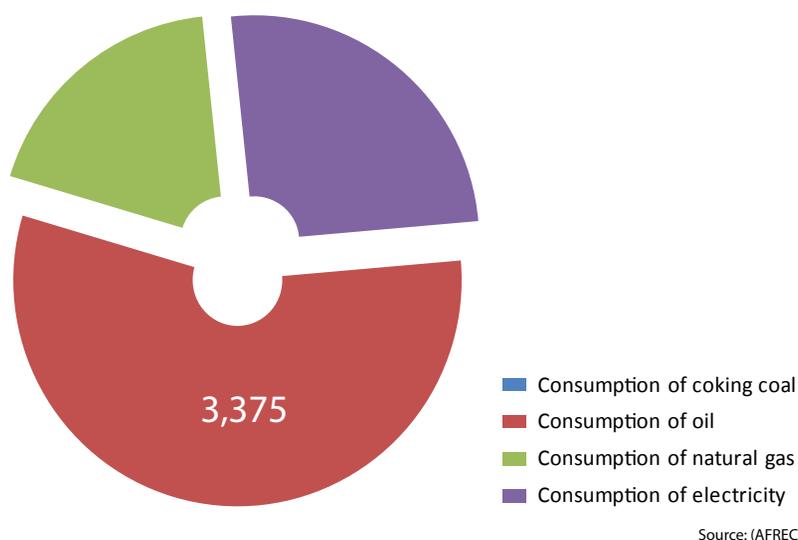


Figure 3: Total energy consumption, (ktoe)



Energy Consumption and Production

In 2013, Tunisia had a population of 10.89 million (Table 1). Total electricity production in 2015 was 1,523 ktoe, with 97 per cent from fossil fuels and 2.6 per cent from solar and wind energy. Final electricity production was 1,523 ktoe, as shown in Table 2 (AFREC, 2015). Figures 2 and 3 show the main energy statistics.

Table 1: Tunisia's key indicators

Key indicators	Amount
Population (million)	10.89
GDP (billion 2005 USD)	43.34
CO ₂ emission (Mt of CO ₂)	23.65

Source: (World Bank, 2015)

Energy Resources

Biomass

There is minimal use of traditional biomass fuels in Tunisia as almost the entire country has access to electricity and to non-solid fuels for cooking. Only 0.93 per cent of the rural population and 0.01 per cent of the urban population use wood or charcoal for cooking (World Bank, 2015). The production of charcoal has remained almost stable over the last decade averaging 150 ktoe over the last decade (AFREC, 2015). Wood is frequently used in the tabouna or traditional bread oven. There were efforts to improve fuel efficiency and reduce emissions through an improved lid design.

Other biomass energy projects include waste to energy project such as biomass gasification using poultry waste and a 10 MW waste-to-electricity project at the Jebel

Chakir landfill in the capital Tunis (REEEP, 2012). Feedstock for these waste-to-energy projects come from organic waste as listed in REEEP (2012):

- 2.2 million tonnes of household waste;
- 2.2 million tonnes from farms and agro-industry;
- 1 million tonnes from olive oil processing;
- 400,000 tonnes from poultry droppings; and
- 200,000 tonnes from waste-water treatment.

Hydropower

In 2015, the total electricity produced was 1,535 ktoe and only 5 ktoe of that was produced from hydro sources (AFREC, 2015). The installed hydropower capacity at the end of 2011 was 70 MW (WEC, 2013). Hydro electricity is not an important part of the energy mix, however government is in the process of developing more hydropower by building small and mini-hydro dams where feasible (REEEP, 2012).

Table 2: Total energy statistics (ktoe)

Category	2000	2005	2010	2015 P
Production of coking coal	-	-	-	-
Production of charcoal	121	152	148	149
Production of crude oil, NLG and additives	3,445	3,201	3,453	2,722
Production of natural gas	2,095	2,323	2,980	2,276
Production of electricity from biofuels and waste	0	0	0	0
Production of electricity from fossil fuels	861	1,102	1,368	1,490
Production of nuclear electricity	-	-	-	-
Production of hydro electricity	6	12	4	5
Production of geothermal electricity	-	-	-	-
Production of electricity from solar, wind, Etc.	2	4	12	40
Total production of electricity	868	1,118	1,421	1,535
Refinery output of oil products	1,635	1,569	255	1,725
Final Consumption of coking coal	66	0	0	0
Final consumption of oil	3,625	3,816	3,849	3,375
Final consumption of natural gas	641	844	1,228	1,128
Final consumption of electricity	779	966	1,165	1,523
Consumption of oil in industry	1,000	948	1,054	746
Consumption of natural gas in industry	476	593	880	1,019
Consumption of electricity in industry	397	407	440	414
Consumption of coking coal in industry	0	0	0	0
Consumption of oil in transport	1,561	1,667	1,921	1,726
Consumption of electricity in transport	9	3	26	10
Net imports of coking coal	0	0	0	0
Net imports of crude oil, NGL, Etc.	-1,623	-1,621	-3,457	-3,497
Net imports of oil product	2,568	3,080	3,806	2,959
Net imports of natural gas	1,736	1,861	2,231	2,666
Net imports of electricity	0	-3	2	-3

- : Data not applicable

0 : Data not available

(P): Projected

(AFREC, 2015)

Oil and natural gas

The proven oil recoverable reserves at the end of 2011 were 55 million tonnes (400 million barrels) and oil production figures were 3,700 thousand tonnes (72,121 thousand barrels). In 2011, the proven recoverable reserves of natural gas were 65.1 bcm (2,300.1 bcf) (WEC, 2013).

Peat

Tunisia has 1 km² of peatland (WEC, 2013).

Wind

According to the Wind Atlas for Tunisia published in 2009, several sites have been identified with good potential for wind power, with average wind speeds of between 5.9 to 6.73 m/s at 80 m (GIZ, 2013). Some of the potential sites include Zaghuan, Kasserine, Kebili and Nabeul, among others (GIZ, 2013) and when developed could eventually generate up to 1,000 MW of electricity (REEEP, 2013).

The gross wind energy potential in Tunisia is estimated at more than 8,000 MW (GIZ, 2013). By the end of 2013, wind power accounted for 245 MW (GWEC, Various years).

Geothermal

The southern part of the country, specifically, Kebili, Gabes and Tozeur regions, is rich in hot springs which are a good indicator of geothermal activity. The geothermal resources originate from the extensive Continental Intercalaire aquifer covering an area of 1 million km² and spreading into the neighbouring countries of Libya and Algeria. The aquifer is about 2.8 km deep and temperatures range from 30 to 80°C (REEEP, 2012), (Mohammed, 2015). The huge thermal resources amounting to about 1.1 billion m³ have been extensively used for heating greenhouses, irrigation and for recreational thermal baths (Mohammed, 2015). Although the proportions vary from region to region, agriculture utilizes

the biggest share at 76 per cent followed by the drinking water and tourism sectors at 19 and 5 per cent respectively (Mohammed, 2015).

Solar

Tunisia has massive potential for solar energy and although it is currently under utilizing this potential, things are changing with the government paying more attention to this energy resource. The 2010-2016 Tunisian Solar Plan aims to increase the use of renewables in the energy mix by increasing the use of solar energy; and this is expected to result in national energy savings of 660 ktoe per annum (REEEP, 2012). The mean daily insolation was measured at 5.0-5.5 kWh/m² (REEEP, 2012).

Tracking progress towards sustainable energy for all (SE4All)

By 2010, 100 per cent of Tunisia's had access to electricity in both rural and urban areas (World Bank, 2015). In addition, 99.96 per cent of the population also has access to non-solid fuels (World Bank, 2016). The high connection rate is the result of constant efforts by the government over the past 30 years (Table 3 and Figure 4).

Between the 1990-2000 and 2000-2010 period, energy intensity decreased from a compound annual growth rate (CAGR) of -0.73 per cent to -1.13 per cent. Over the tracking period 2010-2012, it further decreased to -2.77 per cent. The energy intensity of the Tunisian economy (the ratio of the quantity of energy consumption per unit of economic output) decreased from 3.9 MJ in 2010 to 3.6 MJ per US dollar (2005 dollars at PPP) (World Bank, 2015).

The share of renewable energy in the total final energy consumption (TFEC) has been declining. In 1990, it was 14.5 per cent, decreasing to 13.05 per cent in 2012 (World Bank, 2015); (World Bank, 2016). Traditional biofuels such as woody biomass formed the biggest share of renewable sources at 12.1 per cent of TFEC in 2012, with modern biofuels and hydropower forming 0.2 and 0.1 per cent, respectively (World Bank, 2015). Renewable sources contributed only a 1.7 per cent share of electricity generation in 2012 (World Bank, 2013); (World Bank, 2015).

Table 3: Tunisia's progress towards achieving SDG7 – Ensure access to affordable, reliable, sustainable and modern energy for all

Target	Indicators	Year					
		1990	2000	2010	2012	2000-2010	2011-2015
7.1 By 2030, ensure universal access to affordable, reliable and modern energy services	7.1.1 Per cent of population with access to electricity	93	95	100	100		
	7.1.2 Per cent of population with primary reliance on non-solid fuels	84	94	100	99.96		
7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	7.2.1 Renewable energy share in the total final energy consumption	14.5	14.2	14.6	13.05		
7.3 By 2030, Double the rate of improvement of energy efficiency	7.3.1 GDP per unit of energy use (constant 2011 PPP \$ per kg of oil equivalent)			11.4	11.5 (2011)	11.22 (2013)	
	Level of primary energy intensity(MJ/\$2005 PPP)	4.6		3.9	3.6	3.64	3.64

Sources: (World Bank, 2015); (World Bank, 2016)

Figure 4: SDG indicators

Percentage of population with access to electricity	Access to non-solid fuel (% of population)	GDP per unit of energy use (PPP \$ per kg of oil equivalent) 2013	Renewable energy consumption (% of total final energy consumption), 2006-2011, 2012
100%	99.96%	11.59	13.05%
			

Table 4: Tunisia's key aspects/key mitigation measures to meet its energy Intended Nationally Determined Contributions (INDCs)

INDC
* Intensify the promotion of energy efficiency in all consumer sectors and for all energy usages.
*Achieve an installed renewable energy capacity of 3,815 MW in 2030, including 1,755 MW for wind power, 1,610 MW for solar photovoltaic (PV) and 450 MW for concentrated solar power (CSP).
*Triple the solar water heater distribution rate, which will exceed 220 m ² of collectors per 1,000 inhabitants in 2030, compared to 73 in 2015.

Source: (MEM, 2015)



Road side petrol station, Djerba, Tunisia

Table 5: Tunisia's institutional and legal framework

Basic Elements	Response
Presence of an Enabling Institutional Framework for sustainable energy development and services (Max 5 institutions) most critical ones	Ministry of Industry and Energy (TMIE).
Presence of a Functional Energy Regulator	National Agency for Energy Conservation
Ownership of sectoral resources and markets (Electricity/power market; liquid fuels and gas market)	
Level of participation in regional energy infrastructure (Power Pools) and institutional arrangements	Comite Maghrebin de L'electricite (COMELEC)
Environment for Private Sector Participation	
Whether the Power Utility(ies) is/are vertically integrated or there is unbundling (list the Companies)	(Société Tunisienne de l'Electricité et du Gaz, Tunisian Company for Electricity and Gas is the sole organization responsible for transmission and distribution and retains control of the existing power generation facilities
Where oil and gas production exists, whether upstream services and operations are privatized or state-owned, or a mixture (extent) e.g., licensed private exploration and development companies)	State owned Entreprise Tunisienne des Activités Pétrolières, Tunisian Refining Industry Company created in 1972 plans oil and gas explorations and manage national gas and petroleum wealth
Extent to which Downstream services and operations are privatized or state-owned, or a mixture (extent)	(Société Nationale de Distribution des Pétroles, National Company of Oil Distribution shares the oil distribution market with some private companies (s.a. Total, Shell, BP, etc.)
Presence of Functional (Feed in Tariffs) FIT systems	To be determined by Minister of Industry
Presence Functional IPPs and their contribution	Carthage Power Company produces 10 per cent of electricity consumed (86 per cent by STEG)
Legal, Policy and Strategy Frameworks	
Current enabling policies (including: RE; EE; private sector participation; & PPPs facilitation) (list 5 max) most critical ones	Energy management programme 2008-2011
Energy Transition Fund	
Renewable Energy and Energy Efficiency Plan 2008	
National Fund for Energy Efficiency Subsidies	
Current enabling laws/pieces of legislation (including: RE; EE; private sector participation; & PPPs facilitation) – including electricity/grid codes & oil codes (5 max or yes/no) most critical ones	<ul style="list-style-type: none"> • Energy Sector is Law No. 2004-72 of 2004 on the rational use of energy • Law No. 62-8 of 1962 that established the Société Tunisienne d'Electricité et du Gaz (STEG) • Law N° 2005-106 that created the National Energy Fund • Act 2009-7 of 2009 amending the 2004 Law on Energy Conservation to allow IPPs • Renewable energy law 2015

This table was compiled with material from (REEEP, undated) and (GIZ, 2013)

Intended Nationally Determined Contributions (INDC) within the framework of the Paris climate Agreement

Tunisia aims to lower its carbon intensity by 41 per cent by 2030 compared to the 2010 base year. To do so, it proposes reducing its greenhouse gas emissions across all sectors. The country has published its Intended Nationally Determined Contributions (INDC). Those related to energy are listed in Table 5.

Institutional and Legal Framework

The Ministry of Industry and Energy is in charge of the energy sector (Table 5). The energy regulator is the National Agency for Energy Management. The state-owned Tunisian Company of Electricity and Gas (STEG) is the sole generator, transmitter and distributor of electric energy. On a regional level, Tunisia is a member of Comite Maghrebin de L'electricite (COMELEC), the power pool of the Magreb region. There are also interconnections with the European Electricity Grid to export up to 1,000 MW (800 MW gas and 200 MW Renewable Energy (RE)).

Article 44 of the new Tunisian Constitution of 2014 commits the government to “provide the means necessary to guarantee a healthy and balanced environment and contribute to the climate’s integrity” (GOT, 2015). The energy sector is central to the policy of addressing climate change.