

# Mapping a Changing Energy Landscape in North Africa in Relation to Climate Change and Extreme Events: the Tunisia Case

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## BACKGROUND

Climate change has received great attention during the last decade for its negative impact on the earth ecosystem, activities and on the world economy. The world summit on sustainable development WSSD/ONG, Earth Summit 2002 in Johannesburg, held 10 years after the 1992 Earth Summit in Rio, discussed the sustainable development by the United Nations and pointed out the disastrous and harmful impact of using non-clean energy on human health and the environment.

Due to the fact that energy and climate change are intrinsically linked and that the way in which we consume energy determines environmental impact, and in order to avoid risks of extremes climate change, which were the main topics in the Kyoto protocol, COP21, COP22 and COP23. Along with improving system efficiency, the use of renewable energy could be an alternative which has become exceedingly important with its improved technology and commercial affordability. Tunisia, who has an energy situation characterized by a heavy dependency on natural gas and oil (dependency on fossil energy at 99% of the mix in 2015), is very aware of the climate change and extreme weather challenges. Tunisia has worked since 1992 to include adaptation to climate change in its development planning process at both the global and sectorial levels by offering opportunities to alternative pollution free technologies for energy supply and make CO2 free energy system an energy-related policy as a priority of the government. Since 2011, Tunisia is a part of the EU Research and Innovation program Horizon 2020 and aims to provide 12% of electricity by 2020 and 30% of electricity by 2030 produced from renewable sources. The Tunisian government aims also to reduce the greenhouse gas emission across all sector in order to lower it by 40% in 2030, relative the base year 2010 and the mitigation effort will particularly concentrate efforts on the energy sector as this it account for 75% of the emission reduction contribution to the carbon decrease intensity.

## CURRENT SITUATION IN TUNISIA

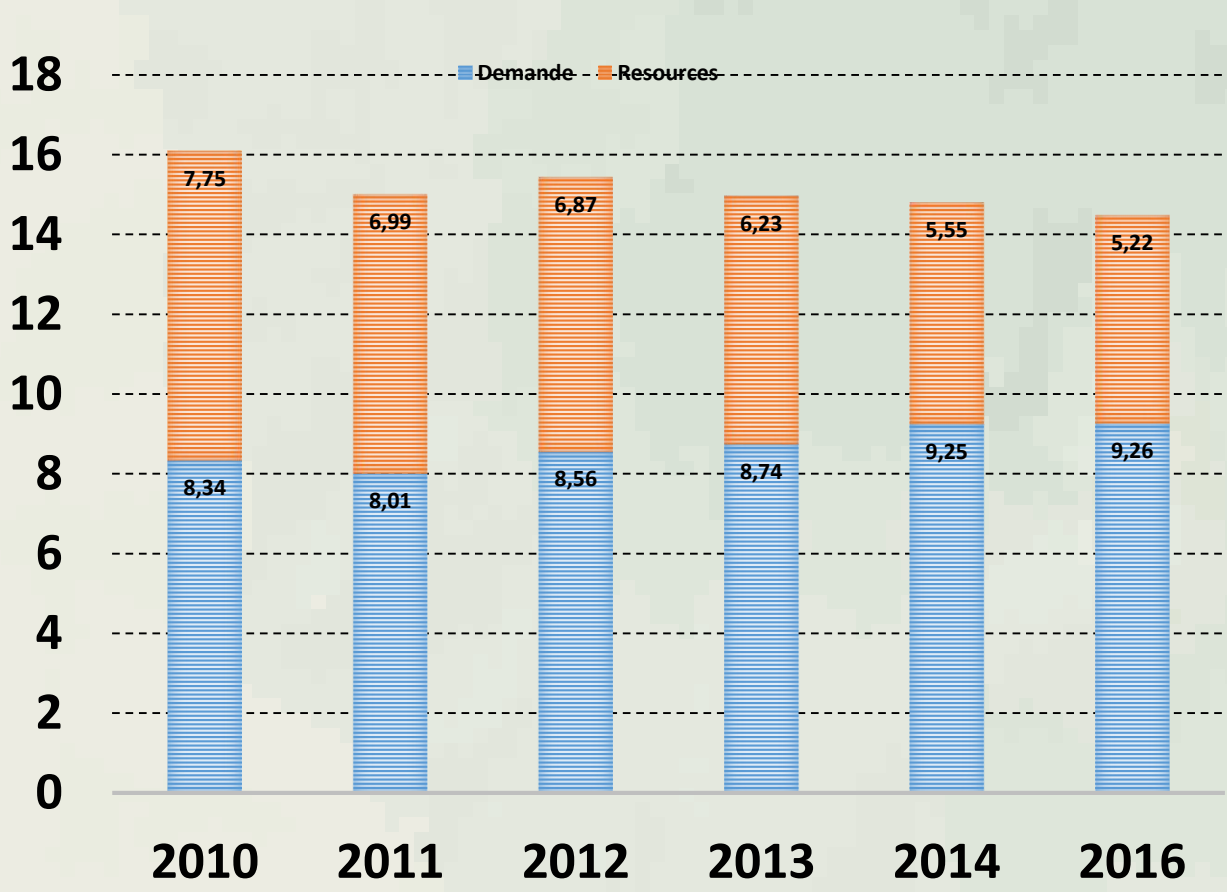


FIG 1. ENERGY SITUATION IN TUNISIA BETWEEN 2010- 2016,

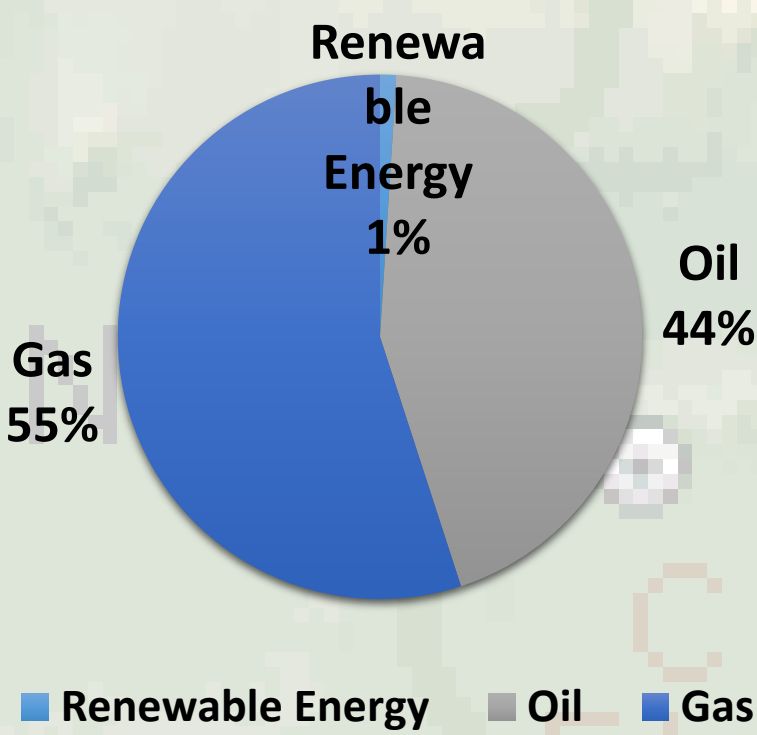


FIG 2. ENERGY MIX IN TUNISIA IN 2015.



FIG 3. CO2 EMISSION IN TUNISIA FROM 2002 – 2014.

TAB1: EXTREMES EFFECTS ON TUNISIA FOR HIGH AND LOW EMISSION SCENARIO.

	High Emission scenario	Low Emission scenario
Temperature	Annual temperature is projected to rise about 5.3 °C on average from 1990 -2100	The temperature rise is limited to about 1.6 °C
Days of warm spell	The number of days of warm spell is projected to increase from less than 10 days in 1990 to about 180 days on average 2100	The days of warm spell are limited to about 40 on average
People affected flooding	An annual average of 78700 people are projected to be affected by flooding due to the sea level rise between 2070 and 2100	A major scale up in protection could keep the annual affected population to about 100 people

## TUNISIAN CONTRIBUTION TOWARDS MITIGATION AND SUSTAINABLE ENERGY PROGRAMS

TAB 2 . TUNISIAN COMMITMENT FIGHTING AGAINST CLIMATE CHANGE.

Year	Action
1992	Tunisia signs the UNFCCC
2002	Portfolio of projects to reduce GHG emission.
2003	Tunisia ratifies the KYOTO protocol.
2007	Air quality law.
2008	National Energy efficiency program.
2009	Tunisian Solar plan 2010/2016.
2010	Nationally appropriate mitigation plans
Since 2012	Preparation of new regulatory framework for RE (Electricity production).
2014	New constitution states climate must be protected. Under Article 44 of the new constitution, the state shall “provide the means necessary to guarantee a healthy and balanced environment and contribute to climate’s integrity.”
2015	Law N° 12 : Electricity production from Renewable Energy.
2016 (August)	Decree N° 1123: Definition of conditions and procedures for implementing RE projects. October 2016: End of preparation of grid codes and contracts (currently under publication).

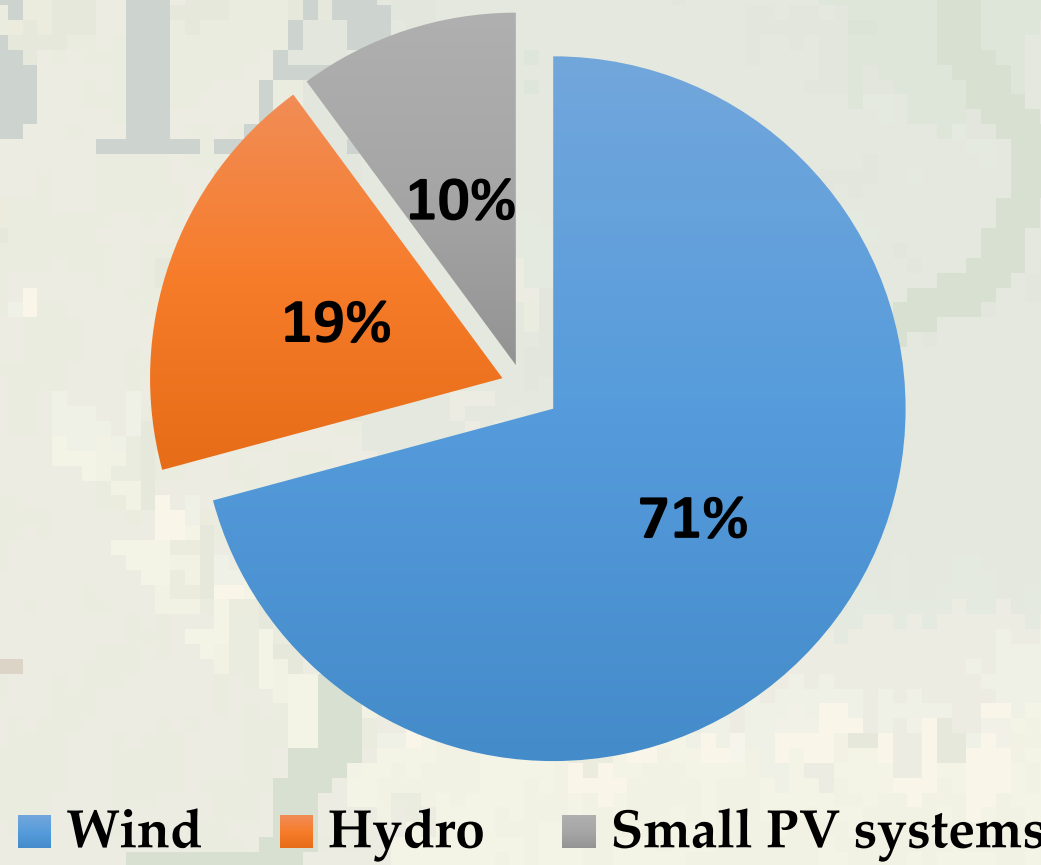


FIG 4: MIX RENEWABLE ENERGY 2020,

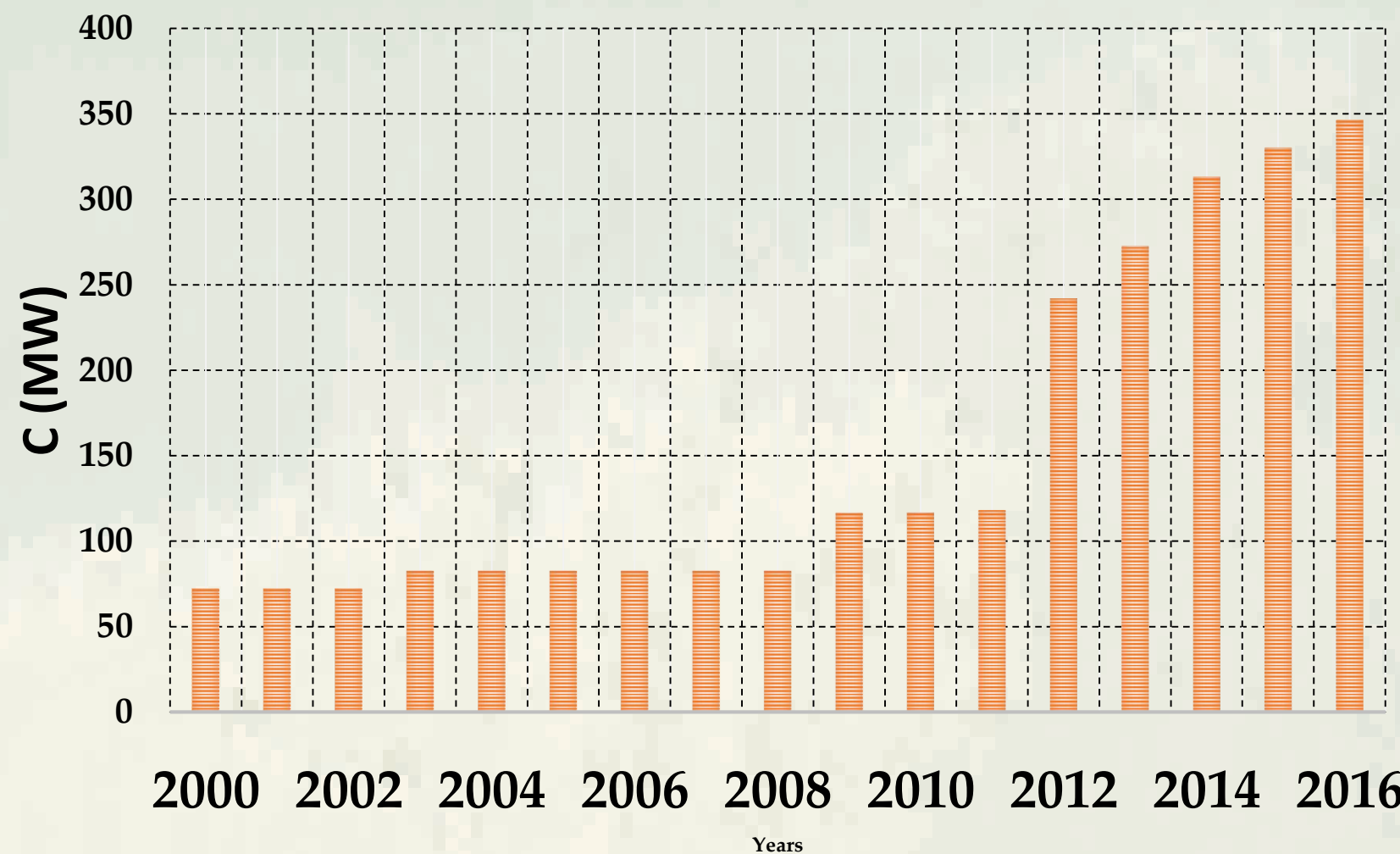


FIG 5.: RENEWABLE ENERGY INSTALLED CAPACITY IN TUNISIA ( 2000-2016).

By 2030, it is aimed to achieve an installed renewable energy capacity of 3,815 MW, including 1.755 MW of wind energy, 1.610 MW for solar photovoltaic (PV), 100 MW of biomass and CSP 450 MW, allowing 12% of electricity produced from RE by 2020 and 30% of electricity from RE by 2030. Concerning the solar heating, Tunisia intends to triple the solar water heater distribution rate for more than 220 m² of collectors per 1,000 habitants in 2030, compared 73 m² per 1,000habitant in 2015.

## References

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