



Figure 1: Energy profile of Niger

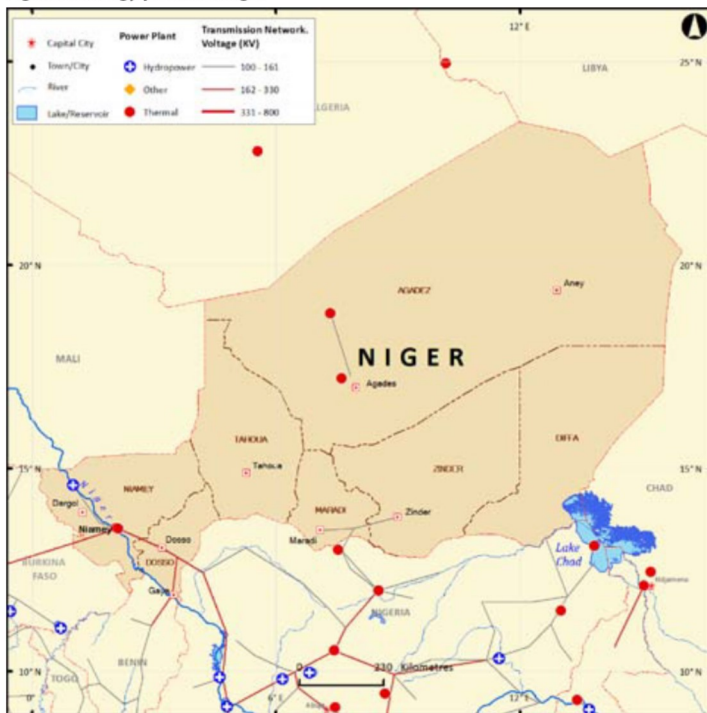


Figure 2: Total energy production, (ktoe)

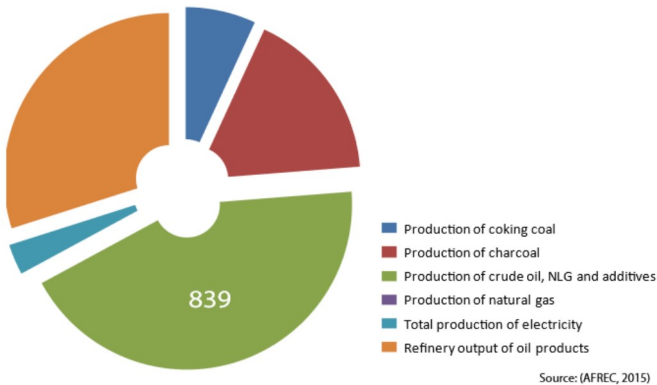
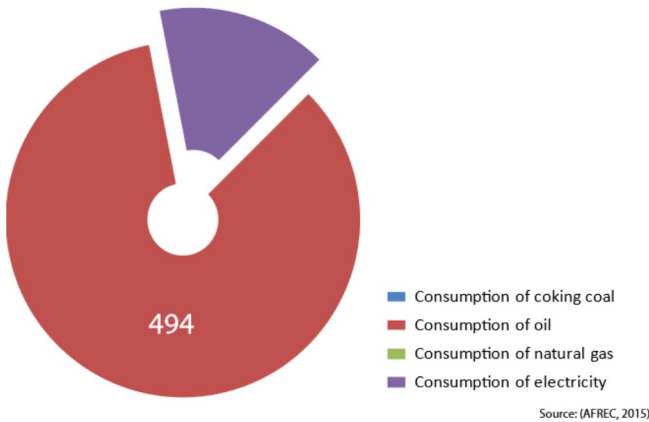


Figure 3: Total energy consumption, (ktoe)



## Energy Consumption and Production

As shown in Table 1, Niger had a population of 17.83 million in 2013. In 2015, total production of electricity was 58 ktoe, with all of it produced from fossil fuels (Table 2). Final consumption of electricity in the same year was 91 ktoe (AFREC, 2015). Figures 2 and 3 show the main energy statistics

Table 1: Niger's key indicators

Key indicators	Amount
Population (million)	17.83
GDP (billion 2005 USD)	5.18
CO <sub>2</sub> emission (Mt of CO <sub>2</sub> )	1.85

Source: (World Bank, 2015)

## Energy Resources

### Biomass

There is huge potential for harnessing energy from biomass in this country. It is estimated that the current forest stock stands at about 9.9 million ha and there is also potential from agricultural (crop and animal) waste. Biogas is only at the experimental stage (REEEP, 2012).

### Hydropower

The Niger River has about 270 MW of undeveloped hydroelectric potential. Current projects include the 125 MW Kandadji project, 200 km upstream from Niamey, the capital, as well as two smaller dams at Gambou (122 MW) and Dyodyonga (26 MW). Small hydroelectric sites in the country have the potential to produce nearly 8 GWh per year, most notably Sirba and Gouroub Dargol (REEEP, 2012).

### Oil

There have been recent discoveries of oil and gas. Oil production started in 2011 in a joint venture with the Chinese National Petroleum Corporation (CNPC). A new refinery with a 20,000 bbl/day capacity has also been built (IRENA, 2013).

**Table 2: Total energy statistics (ktoe)**

Category	2000	2005	2010	2015 P
Production of coking coal	81	93	126	133
Production of charcoal	210	232	316	327
Production of crude oil, NLG and additives	0	0	0	839
Production of natural gas	-	-	-	-
Production of electricity from biofuels and waste	0	0	0	0
Production of electricity from fossil fuels	18	20	21	58
Production of nuclear electricity	-	-	-	-
Production of hydro electricity	-	-	-	-
Production of geothermal electricity	-	-	-	-
Production of electricity from solar, wind, Etc.	0	0	0	1
Total production of electricity	18	20	21	58
Refinery output of oil products	0	0	0	579
Final Consumption of coking coal	0	103	101	0
Final consumption of oil	153	175	257	494
Final consumption of natural gas	-	-	-	-
Final consumption of electricity	28	37	72	91
Consumption of oil in industry	13	19	50	97
Consumption of natural gas in industry	-	-	-	-
Consumption of electricity in industry	12	15	14	21
Consumption of coking coal in industry	0	0	0	0
Consumption of oil in transport	125	139	221	347
Consumption of electricity in transport	-	-	-	-
Net imports of coking coal	0	0	0	0
Net imports of crude oil, NGL, Etc.	0	0	0	0
Net imports of oil product	178	194	306	-55
Net imports of natural gas	-	-	-	-
Net imports of electricity	18	29	56	55

- : Data not applicable

0 : Data not available

(P): Projected

(AFREC, 2015)

## Wind

In the north, average wind speeds of 5 m/s have been measured, tapering off to about 2.5 m/s in the south. These figures indicate a moderate potential for wind energy exploitation. Currently, about 30 small-scale installations are used for water pumping purposes (REEEP, 2012).

## Nuclear

Uranium is mined in 20 countries and half the world's production of uranium comes from just six countries, of which Niger is one. In sub-Saharan Africa, Namibia, Niger and South Africa are among the ten-largest uranium resource-holders in the world (WEC, 2013). Niger provides 7.7 per cent of global production.

## Geothermal

Although many geological studies have been undertaken for oil in this country, so far none has been done to assess the geothermal potential (REEEP, 2012).

## Solar

Niger receives between 7 and 10 hours of sunshine per day with an average solar energy potential of 5-7 kWh/m<sup>2</sup>/day. In the 1960s, Niger was one of the first countries in the world to consider renewable energy technologies to solve its energy needs. It set up the National Solar Energy Centre (*Centre National d'Énergie Solaire – CNES*), which was originally founded to undertake applied research in various aspects of renewable energies.

## Tracking progress towards sustainable energy for all (SE4All)

By 2012, only 14 per cent of Niger was electrified (Table 3 and Figure 4) (World Bank, 2016). In urban areas, 62 per cent of people had access to electricity but in rural areas, only 5 per cent. National access to non-solid fuels in 2012 was only 3 per cent. Disaggregated by location, it was 2 per cent in rural areas and 7 per cent in urban areas (World Bank, 2015).

Niger's energy intensity increased at a compound annual growth rate (CAGR) of -2.60 per cent over the 20 years between 1990 and 2010 and at 0.60 per cent CAGR from 2010 to 2012. Between 2010 and 2012, the Niger economy's energy intensity (the ratio of the quantity of energy consumption per unit of economic output) increased from 6.2 MJ to 6.3 MJ per US dollar (2005 dollars at PPP) (World Bank, 2015).

The share of renewable energy in total final energy consumption (TFEC) decreased from 91.6 to 83.54 per cent between 1990 and 2012. In 2012, traditional solid biofuels formed the biggest share of renewable sources at 78.0 per cent, followed by modern biofuels at 1.7 per cent of TFEC (World Bank, 2015).

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





The country has committed to implementing activities to reduce emissions and contribute to controlling climate change. The Intended Nationally Determined Contributions (INDC) related to energy were prepared in October 2015 and are listed in Table 4.

**Table 3: Niger'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	6	7	9	14		
	7.1.2 Per cent of population with primary reliance on non-solid fuels	2	2	3	3		
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	86.8	93.9	73.7	79.7		
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)				5.7 (2013)		
	Level of primary energy intensity(MJ/\$2005 PPP)	10.6		6.2	6.3		

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
14.4%	3.18%	5.9	81.27%
			

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

INDC
*Implement the management of residential sub-sector through rural electrification and the conservation and replacement of wood energy.
*Implement a management plan of the transportation and residential sub-sectors, and promote rural electrification.
*Adopt plans for wood energy saving and reduction of specific consumption in transportation.
*Implement a management plan for the sector concerned with the demand for, transformation and dissemination of renewable energies; improve the energy efficiency of the sectors.
*Promote solar photovoltaic for pumping and electrification.
Conditional technologies
*Exploit solar photovoltaic and thermal energy and wind energy sources.
*Build a nuclear power plant and a gas power plant and develop hydroelectricity programme.
*Save wood use in cooking, adopt energy efficiency programme, promote the use of biogas, and promote the construction of frame-free buildings.

Source: (MEM, 2015)

**Table 5: Niger’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 Energy and Petroleum
Presence of a Functional Energy Regulator	Autorité de Régulation Multisectorielle (ARM) the Multi-Sector Regulatory Authority,
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	
Environment for Private Sector Participation	
Whether the Power Utility(ies) is/are vertically integrated or there is unbundling (list the Companies)	
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)	<ul style="list-style-type: none"> <li>• Chinese National Petroleum Corporation (CNPC)</li> <li>• Société de Raffinage de Zinder (SORAZ) or Zinder Refining Company established in 2010, refines crude oil produced in Niger</li> </ul>
Extent to which Downstream services and operations are privatized or state-owned, or a mixture (extent)	Société nigérienne des produits pétroliers (SONIDEP), Tamoil, Mobil and Total Société nigérienne des hydrocarbures (SONIHY) and the Niger gas companies NIGERGAZ and SONIGAZ import gas
Presence of Functional (Feed in Tariffs) FIT systems	
Presence Functional IPPs and their contribution	
Legal, Policy and Strategy Frameworks	
Current enabling policies (including: RE; EE; private sector participation; & PPPs facilitation) (list 5 max) most critical ones	• Energy Policy Statement 2004
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"> <li>• Act 98-017 establishing National Centre for Solar Energy in 1998</li> <li>• Electricity Code was enshrined into law through Decree no. 2003-2004</li> </ul>

This table was compiled with material from (REEEP, 2012) and (IRENA, 2013)

## Institutional and Legal Framework

The Ministry of Energy and Petroleum is in charge of the energy sector. The *Société Nigérienne d'Electricité* (NIGELEEC) is responsible for electricity production, transmission and distribution. The sector regulator is the Autorité de Régulation Multisectorielle (ARM) (Table 5). On a regional level, Niger is a member of the West African Power Pool. The legal framework is provided by the Electricity Act of 1939 (amended in 1991).

Niger relies heavily on imported electricity from Nigeria. Challenges in Nigeria coupled with

growing energy demand in Niger is leading to frequent shortages and blackouts, limiting socioeconomic growth. Niger aims to diversify its energy supply base, particularly focusing on renewable energy resources. The 2004 Energy Policy Statement has been strengthened by other strategies including the National Renewable Energies Strategy, National Strategy for Access to Modern Energy Services, National Strategy for Domestic Energies and the Strategy for Rural Development; all aim to enhance renewable energy while protecting the environment.