



Figure 1: Energy profile of Somalia



Figure 2: Total energy production, (ktoe)

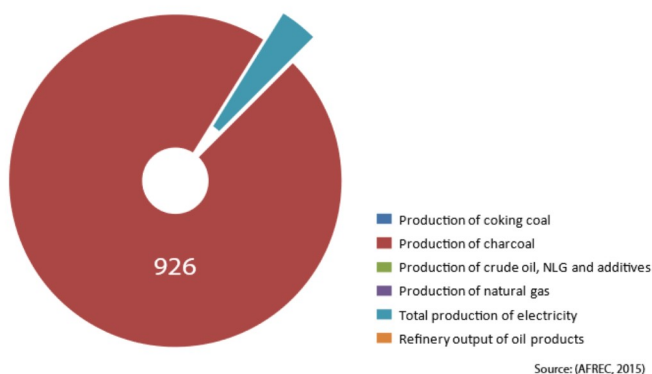
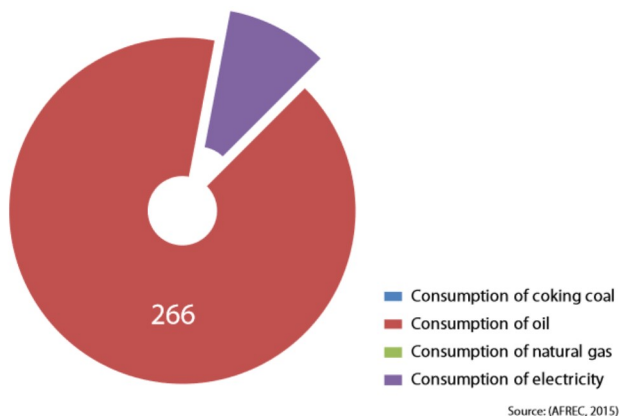


Figure 3: Total energy consumption, (ktoe)



Energy Consumption and Production

The population of Somalia in 2013 was 6.17 million people (Table 1). Total electricity produced in 2015 was 35 ktoe, with 97.1 per cent produced from fossil fuels. Final electricity consumption in 2015 was 28 ktoe (AFREC, 2015). Table 2 shows the energy statistics of Somalia.

Table 1: Somalia's key indicators

| Key indicators | Amount |
|---|--------|
| Population (million) | 6.17 |
| GDP (billion 2005 USD) | 3.12 |
| CO ₂ emission (Mt of CO ₂) | 0.89 |

Source: (World Bank, 2015)

Energy Resources

Biomass

Charcoal is a major economic industry in Somalia. It provides both income and the population's energy needs. About 97 per cent of urban households depend on charcoal while rural households rely on firewood as their main source of energy (AfDB, 2013). In the five years from 2010, the amount of charcoal produced almost doubled from 523 to 926 ktoe in 2015 (AFREC, 2015). This is putting massive pressure on the forest resource, contributing to desertification and the destruction of grazing and arable land. For instance, forest cover in 1985 was about 60 per cent of the land area but by 2001, this had declined to about 10 per cent of land area or about 6.5 million ha (REEEP, 2012). There is urgent need for alternative sources of fuel and proposals have indicated biofuels from crop and animal wastes and marine biomass (REEEP, 2012). In addition, improved technologies for sustainable charcoal production should be made (REEEP, 2012).

Hydropower

The deployment of hydroelectricity has been seriously hampered by the security situation in this country. Currently only 2.85 per cent of total electricity is generated from hydropower (AFREC, 2015). The in-country potential for hydropower is estimated at between 100 and 120 MW of which only 4 per cent has been exploited on the Juba river (REEEP, 2012).

Table 2: Total energy statistics (ktoe)

| Category | 2000 | 2005 | 2010 | 2015 P |
|---|------|------|------|--------|
| Production of coking coal | - | - | - | - |
| Production of charcoal | 0 | 0 | 523 | 926 |
| Production of crude oil, NLG and additives | - | - | - | - |
| Production of natural gas | - | - | - | - |
| Production of electricity from biofuels and waste | 0 | 0 | 0 | 0 |
| Production of electricity from fossil fuels | 20 | 23 | 27 | 34 |
| Production of nuclear electricity | - | - | - | - |
| Production of hydro electricity | 0 | 0 | 0 | 1 |
| Production of geothermal electricity | - | - | - | - |
| Production of electricity from solar, wind, Etc. | 0 | 0 | 0 | 0 |
| Total production of electricity | 20 | 23 | 27 | 35 |
| Refinery output of oil products | - | - | - | - |
| Final Consumption of coking coal | - | - | - | - |
| Final consumption of oil | 241 | 244 | 271 | 266 |
| Final consumption of natural gas | - | - | - | - |
| Final consumption of electricity | 19 | 22 | 25 | 28 |
| Consumption of oil in industry | 0 | 0 | 0 | 0 |
| Consumption of natural gas in industry | - | - | - | - |
| Consumption of electricity in industry | 0 | 0 | 0 | 0 |
| Consumption of coking coal in industry | - | - | - | - |
| Consumption of oil in transport | 0 | 0 | 0 | 0 |
| Consumption of electricity in transport | - | - | - | - |
| Net imports of coking coal | - | - | - | - |
| Net imports of crude oil, NGL, Etc. | - | - | - | - |
| Net imports of oil product | 241 | 239 | 150 | 131 |
| Net imports of natural gas | - | - | - | - |
| Net imports of electricity | - | - | - | - |

- : Data not applicable

0 : Data not available

(P): Projected

(AFREC, 2015)

A dam at Bardhere, in southern Somalia, has also been planned. Other challenges to the sector include the seasonality of the rivers.

Oil and natural gas

Somalia's geology, and proximity to traditional oil producers in the Middle East, indicates the potential existence of oil reserves (AfDB, 2013). So far, however, the situation has not been conducive to exploration activities. There are indications that the Dharoor field in Bari province, Puntland has about 1.2 billion barrels of oil with the potential of almost ten times that in deposits and additional potential for off-shore oil and natural gas production in the Indian Ocean and the Red Sea (Balthasar, 2014). Somalia depends on imported petroleum for electricity production and in 2015

97 per cent of the electricity was produced by oil amounting to 34 ktoe (AFREC, 2015). Net imports of oil in 2015 were 131 ktoe (AFREC, 2015). The one refinery stopped operations in 1991 when the political situation deteriorated (REEEP, 2012).

Wind

The extensive coastline with the presence of attractive offshore winds lends itself particularly to the generation of wind energy. Measurements of wind speeds have ranged from a low of 3 m/s to a high of 11.4 m/s (FGS, 2015). Wind energy has been exploited for over 70 years primarily for water pumping. REEEP (2012) estimates that about half the land area has suitable wind speeds for power generation and this could help alleviate some of the existing pressures on

forests for biomass energy and replace some of the diesel electricity generators thus contributing to emissions reduction (REEEP, 2012).

Geothermal

The signs for geothermal potential are poor (REEEP, 2012).

Solar

There is some potential to use the abundant solar energy resources and indeed it is already being exploited. The most common uses include lighting, cooking and water pumping and heating in both public and private buildings. Somalia receives an average solar insolation of between 5 and 7 kWh/ m²/day translating into a total energy capacity of 2,163 million MWh/year (REEEP, 2012) (FGS, 2015).

Tracking progress towards sustainable energy for all (SE4All)

The three 'semi-autonomous' regions of Somalia (Somaliland, Puntland and South-Central Somalia) each have their own separate electricity network. Most of these networks are run by the private sector and based on thermal generation. The country has a national level electrification rate of 32.7 per cent ; 17.3 per cent of rural areas have access to electricity and in urban areas, it is 57.7 per cent (Table 3) (World Bank, 2016). In Puntland, only the main towns like Bosaso have electricity, while in South-Central Somalia, two-thirds of households in Mogadishu and under almost a quarter of households in Merka have access to electricity for lighting (REEEP, 2012).

In the absence of adequate electricity supply, firewood and charcoal remain the main sources of energy. As a result actual consumption of energy is low in comparison with other countries ranging from 20 to 50 kWh/per day per person for cooking and lighting homes and streets (Afgarshe, 2015). Access to modern fuels in 2012 was 4.58 per cent ; only 4 per cent and 5 per cent of rural and urban areas, respectively, use non-solid fuels (World Bank, 2015); (World Bank, 2016).

The share of renewable energy in the total final energy consumption (TFEC) has remained high over the years. In 1990, it was 100 per cent of the energy mix, declining to 94.3 per cent in 2012. Traditional solid biofuels form the biggest share of renewable sources at 65.8 per cent of TFEC in 2012, while modern solid biofuels contributed 28.6 per cent (World Bank, 2015).

Table 3: Somalia'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 | 22 | 26 | 29 | 32.7 | | |
| | 7.1.2 Per cent of population with primary reliance on non-solid fuels | 2 | 2 | 4 | 4.58 | | |
| 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 | 100.0 | 96.3 | 94.8 | 94.3 | | |
| 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) | | | | | | |
| | Level of primary energy intensity(MJ/\$2005 PPP) | | | | | 54.93 | 54.69 |

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 |
|---|---|---|--|
| 32.7% | 4.58% | NA | 94.2% |
|  |  | |  |

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

| INDC |
|--|
| *Accelerate diffusion of energy efficient cook - stoves for reduction in charcoal consumption |
| *Promote sustainable and efficient production of charcoal (green charcoal) for local consumption |
| *Manage energy Plantations sustainably to meet the local demand of charcoal and fuel wood |
| *Establish Liquefied Petroleum Gas (LPG) market and accelerate diffusion to shift from charcoal to LPG in main urban centers |
| *Introduce biogas as an alternative source of energy in areas with heavy loads of biodegradable feedstock |
| *Establish of solar energy market and accelerate diffusion of solar energy equipment to reduce local charcoal production |

Source: (MEM, 2015)

Table 5: Somalia'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 | In Somaliland: <ul style="list-style-type: none"> • Ministry of Mining, Energy and Water Resources • Somaliland Energy Commission • Transitional Federal Government: There are Energy Authorities in Puntland and Somaliland. |
| Presence of a Functional Energy Regulator | |
| 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) | <ul style="list-style-type: none"> • Electricity is supplied by government agencies in the regions of Puntland and Somaliland. • Puntland Electric Energy Authority owns the Bosasso, Garhdo and Garowe power stations. |
| 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) | |
| Extent to which Downstream services and operations are privatized or state-owned, or a mixture (extent) | |
| 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 | |
| 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 | Somaliland Electrical Energy Act of 2013 |

This table was compiled with material from (REEEP, 2012) and (Vredin, Wigan, Kruze, Dyhr-Mikkelsen, & Lindboe, 2010)

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

Thermal energy is a major source of electricity and the utilization of renewable energy resources such as solar, hydroelectric and wind are opportunities that could be used to reduce contributions to global climate change. Somalia has articulated its energy-related Intended Nationally Determined

Contributions (INDC) in line with international requirements. Those related to energy are listed in Table 4.

Institutional and Legal Framework

Somalia has great potential for developing energy from various resources. However, the long period of civil strife has led to serious deficiencies in energy infrastructure development. The Ministry

of Energy and Water is in charge of the energy sector. There is no legal framework governing the entire territory although some regions have developed energy sector laws, such as the Somaliland Electrical Energy Act of 2013 that could provide guidelines for Puntland and South Central Somalia (Table 5).