

# A national energy programme

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**D**jibouti has no indigenous sources of oil, natural gas, hydropower or coal, and energy self-sufficiency is estimated at 32.3 per cent. The majority of imported oil and oil products comes from Saudi Arabia. The national electrification rate in 2003 was 49.5%, and the electrification rate in urban areas was estimated to be 57% in 2006. The government expects 60% of the entire population to have access to electricity in 2015. No major developments to the indigenous transmission network have occurred since the colonial era, although power interconnections with neighbouring countries, particularly Ethiopia, have been developed in recent years.

To address these issues, Djibouti's Ministry of Energy and Natural Resources is currently working on the implementation of a genuinely national energy program that in the very near future will provide our nation with full energy independence. A small country in the Horn of Africa with less than one million inhabitants, we have a very specific goal: achieving energy independence through the use of renewable sources that will allow our citizens, wherever they live, to benefit from abundant access to energy at low prices.

In accordance with the vision of President Ismail Omar Guelleh, Djibouti aims to become the first African country to possess a 100 per cent green energy sector by 2020. To achieve this, we have implemented a process and a set of priorities. Today, the first priority of our energy development program is geothermal.

The geological characteristics of Djibouti are exceptionally favourable for the development of geothermal energy.

In particular, Djibouti includes Afar depression, also called the "Danakil depression", located at the intersection of three important tectonic structures. Djibouti's geothermal energy potential is estimated at around 1,000 MW.

The country is working with its development partners and the private sector, to implement a comprehensive development program to use of geothermal energy in 13 sites.

In 2001, Geothermal Development Associates completed a feasibility study for a 30 MW geothermal power plant in the Lake Assal region, west of the capital. EDD, the state-owned electricity company,

aims to execute the \$115 million plant using a Build-Own-Operate (BOO) model. With financing for the project finally put in place in 2008, Reykjavik Energy Invest (REI), an Icelandic company, is now poised to implement it, replacing some of the electricity currently generated using diesel. Drilling identification of other potential resources is also underway, with a great deal of interest from potential Indian and Chinese investors.

This exploitation of geothermal energy will result in a decrease of 10 per cent per kWh in producing electricity, as well as providing a secure electricity supply for those areas. According to surveys, the replacement of thermal power plants in Djibouti with geothermal will allow Electricité de Djibouti (EDD) to save \$57 million per year.

As part of this process, the Government of Djibouti set up the Office for the Development of Geothermal Energy (ODDEG), which will be responsible for identifying various types of geothermal resources of the country, as well as carrying out exploration and surveys. It will also gather all the skills acquired in the country to develop this energy source.

With ODDEG, inspired by the Kenyan model, Djibouti finally has a structure responsible exclusively for the development of geothermal energy to achieve the exploitation of its resources and reduce energy constraints. Moreover, we intend to create a geothermal source base in the energy development program of the country.

In parallel to this geothermal initiative, Djibouti is preparing to develop solar energy.

## **Other renewables**

Studies conducted in the 1980s indicated that average wind speeds across Djibouti peak at 4 m/s, indicating a moderate potential for wind energy. Government studies in 2002 concluded that Goubet, at the entrance to the Gulf of Tadjourah, has the potential for a 50 MW wind farm, and that Gali Maab Wein and Bada also have significant wind potential.

Djibouti has already finalized with its private partners a 60MW wind project funded by Qatar, a solar 50 MW project financed by private, US and Spanish companies, and a third project of 10MW which is a gift of the UAE as part of its Masdar City program. After the commissioning of an electrical

interconnection line with Ethiopia in 2011, the construction of a second line is also on track.

Djibouti's location on the Horn of Africa is ideal for solar energy. Average daily insolation is 5.5-6.5 kWh/m<sup>2</sup> over the whole country. The Japanese government has recently extended a grant for the installation of solar panels at the Djibouti Centre for Research and Studies, the state scientific institution. Djibouti has set a target of achieving electrification of 30% of the rural population by solar photovoltaics, by 2017. In addition, the government sees solar power as a key tool in electrification and development, and has set several technical and economic targets for the technology by 2017.

In this regard, the government of Djibouti has also recently adopted a new lower price sale of electric energy that will affect nearly 70,000 households across the country. The adoption of this lower rate of electrical energy will contribute to the fight against poverty and improve access to electricity to low-income households. It will improve the purchasing power of households and promote the economic development of the country. Furthermore, this proposed price reduction includes the introduction of incentives to provide access to electricity to low-income households that do not have sufficient financial resources to pay the cost of connection, and that will be spread over 84 months. Djibouti is a pioneer in Africa in the use of technology to address its future energy needs.

### **Economic integration**

Our country is also pushing for greater regional economic integration, and in November 2012, the government approved an intergovernmental agreement between Djibouti, Ethiopia, and South Sudan to build and operate an oil pipeline.

We also have plans to create an oil pipeline from the oil fields of Southern Sudan to Djibouti through Ethiopia. The agreement aims to put the principles of partnership among the three countries and establishes the legal regime that will govern all contracts relating to the proposed construction of the pipeline. The agreement also stipulates the establishment of a tripartite committee to make decisions on all appropriate measures necessary for the success of the project.

There are also plans to build two pipelines linking Ethiopia and Djibouti to transport Ethiopian oil and gas recently discovered there. A framework agreement to this effect was signed between Djibouti and Chinese multinational GCL Petroleum Holding Limited. Framework documents of the agreement also include the construction of a gas liquefaction factory, as well as storage facilities for crude and

refined products, and a bunkering centre in Obock, north of Djibouti, on the Strait of Bab el Mandeb.

Discussions are underway for another pipeline project to carry refined products from the port of Djibouti to Addis Ababa.

This economical and environmentally friendly project also has the advantage of offering greater security, significantly reducing the heavy daily traffic of some 300 trucks along the Ethiopia-Djibouti corridor.

Djibouti will also increase its storage capacity for oil and derivatives. A memorandum of understanding was recently signed between the Ministry of Energy and the Kuwaiti company Independent Petroleum Group (IPG). Construction of the country's first oil refinery was completed in 2011. The refinery's five major products are LPG, bitumen, kerosene, gas oil, and naphtha. The products of the refinery are sold locally, as well as in Ethiopia and Sudan. The refinery is also planning to export its products to Kenya and Uganda.

The construction of these pipelines is one more example of the way the economies of our two countries are increasingly integrating. Indeed, the regional economic integration between Djibouti and our neighbour Ethiopia has reached a point of no return whereby whichever government is in office, our economic partnership will continue to expand, setting an example for a part of the world otherwise characterized by instability and hostilities.

With regard to the valuation of our natural resources, Djibouti is working with research and with gold mining companies including leading international players such as Stratex and Thani Nordana. The results of exploration studies are very encouraging. Oyster Oil and Gas, in turn, is involved in oil exploration, and again, the results are very encouraging.

In short, The government's goals are to improve efficiency and financial performance of the electricity utility through loss reduction measures, and to address key service delivery constraints through rehabilitation and extension of networks, and administrative improvements, as well as to explore new resources for power generation (for example, renewable energy and interconnection with Ethiopia).

The government is also in the process of engaging in a comprehensive solar energy development plan, with various targets for dissemination of the technology, including: equipping 70 rural boreholes and 100 other wells with solar pumps; equipping all rural health centres and 100 rural schools with solar arrays; and the electrification of 5,000 households with solar PV by 2017, increasing rural electrification to 30 per cent. E

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