



eni: Providing access to electricity and reducing gas flaring in the Republic of the Congo

Summary

eni is a leading global energy company with operations in 79 countries and activities in oil and gas production, refining and marketing, electricity generation and sale, petrochemicals, oilfield services construction and engineering.



In Africa, eni has a flaring down strategic plan that seeks to address the dual challenge of fighting energy poverty while tackling climate change. Between 2007 and 2010, eni has reduced flaring by over 30%, and is investing in new energy infrastructure to bring this figure up to 80% by 2015. When fully implemented, the program will recover around 5 billion cubic meters of gas per year.

Where the associated gas is used to supply the local market and produce electricity, the population gains access to a continuous supply of reliable and safe energy. This, in turn, acts as a catalyst for social and economic development.

This case study describes eni's activities in this particular domain in the Republic of the Congo. The company, which has been active in the country in hydrocarbon exploration and production since 1968, signed an agreement with the government to develop two electricity power stations and eliminate gas flaring by 2012.

The agreement envisages the construction in Djeno of the new Centrale Electrique du Congo power station (300 MW, planned for a future output of 450 MW) and the revamping of the existing 50MW Centrale Electrique de Djeno power station. The agreement also includes the exploitation of gas from the M'Boundi oilfield, which is collected and transported through a 55 km pipeline to Djeno. The two new power stations will now provide 60% of the country's installed capacity and expand access to electricity for approximately 700,000 people. Average per capita electricity consumption in the area serviced by eni's investment rose to 350 KWh in 2009 and 462 KWh in 2010, compared with the national average of just 137 KWh per year.

Context

The availability of energy is a prerequisite for development, and the different distribution of energy consumption worldwide represents both a barrier to growth and a cause of inequality.

The lack of access to clean, reliable, and affordable energy sources is a particularly serious problem in Africa, which represents the paradox of being one of the major energy producers while being the continent suffering most from energy poverty.

Energy poverty is a significant issue for eni, whose production is located for 22% in countries that are affected by the lack of appropriate energy services.

eni's work in the Republic of Congo

In the Republic of Congo, 2.3 million people have no access to electricity, and three quarters of its population lives without access to modern sources of energy.

eni has been operating in the Republic of Congo in the hydrocarbon exploration and production sector since 1968. The company's operations are regulated by Production Sharing Agreements (PSA), and are situated in the conventional and deep-water offshore area facing Pointe-Noire as well as in the onshore sector.



In 2010, eni's share of hydrocarbon production in the country amounted to 110 kboe/d of oil equivalent per day (boe/day). In that same year, the company employed 861 people (128 of which were expatriates), in addition to 5,984 provided by external companies.

In Africa, eni operates in 16 countries, and is the leading international oil company in terms of hydrocarbons production, with approximately a million barrels of oil per day.

eni's integrated approach

In many of its areas of operations, eni has developed an integrated approach that deals with

- Relations with local communities
- Climate change and carbon management
- Sustainability-oriented partnerships with other actors

Relations with local communities

In order to guarantee continuous dialogue with the local population in Congo, eni engages in regular dialogue with its stakeholders in view of maintaining good relations with representatives of local communities, authorities, and representatives of civil society (e.g., the Pointe-Noire dioceses and town council, the Kuoilou and Pointe-Noire Prefect and Deputy Prefect, village heads, associations, etc.).

The company's integrated approach is focused not only on industrial development and risk management, but also on local and human development, most notably by supporting projects and programs aimed at improving the quality of life (e.g., electricity power

stations, electricity supply networks, healthcare and school programs, agricultural projects).

Climate change and carbon management strategy

eni's climate strategy views the shift to a low-carbon economy as both a challenge and a business opportunity. Company actions encompass energy efficiency measures, reduction of gas flaring, developing opportunities in the gas market, and increasing the share of energy from renewable sources.

Short term mitigation objectives are particularly focused on lowering emissions via reduced gas flaring and on the implementation of energy efficiency programs at industrial plant level.

Flaring is the practice of burning the natural gas associated with oil extraction by torch. Flaring occurs at oil extraction sites that lack the systems and the infrastructure to recover the natural gas. In addition, the choice of burning this gas is in some cases determined by the absence of a local gas market, or by the absence of a proper infrastructure network required for the gas to be used locally or exported.

From an economic perspective, flaring wastes¹ an important resource, which is then managed as waste, thus generating a negative impact locally and globally in terms of CO₂ and other greenhouse gases being emitted into the atmosphere.

Taking 2007 as a baseline year, eni's aim is to reduce 80% of its flaring emissions by 2015. This entails US\$ 1.1 billion of investments, and combines the progressive reduction of gas flaring with an increase in the valuation of the associated gas.

Sustainability-oriented partnerships with other actors

Significant amounts of investment, technology, and expertise need to be deployed to enable access to clean, reliable and affordable energy sources for low-income populations at the "base of the economic pyramid". This calls for cross-cutting synergies among different actors and sectors. The business sector can provide technologies, innovative solutions and financial resources but, given the complexity of energy access issues and the extent of possible solutions, no single actor can act alone. The company therefore engages in and cooperates with organizations like the United Nations, the World Business Council for Sustainable Development, NGOs, academia, and other major groups.

¹ In 2010, 134 billion cubic meters of natural gas were globally flared. In Africa alone, 35 billion cubic meters of natural gas are flared every year.

eni's access to energy projects in Congo

eni signed a first agreement with the Republic of Congo in 2007. It presented a four-year plan to the Congolese authorities, setting out its commitment to produce electricity for the country thanks to two electric power stations and eliminate gas flaring by 2012.

Gas flaring would be eliminated by re-using the gas in view of producing electricity, and remaining parts of the gas would be reinjected into the hydrocarbon deposit.



The gas, which comes from the Kitina, Djamabala and Foukanda offshore deposits, is collected and transported along the 55-kilometer gas pipeline to the Djeno area, where it contributes to fuelling the 50 MW Centrale Electrique Djeno (CED) and the new Centrale Electrique du Congo (CEC). The latter had a 300 MW capacity as of December 2010, which is expected to increase to 450 MW by 2012. CEC is not operated directly by eni, which holds a 20% stake in the power station, while the remaining 80% is held by the Congolese government. The gas power plant of Congo (CEC) was inaugurated on 23 December 2011 by the head of state Denis Sassou Nguesso who also started up the high voltage power line between Pointe-Noire and Brazzaville.

The two power stations currently provide 60% of the country's installed capacity, and it is distributed in the Pointe-Noire area, which has a population of approximately 700,000 people. While average electricity per capita consumption in Congo² is around 137 Kwh per year, the average figure in the Pointe-Noire area in 2009 rose to 350 KWh and 462 KWh in 2010.

EniPower, the subsidiary that constructs and runs EniPower stations in Italy, has its own workforce operating in the country, and also offers support to Congolese technicians in optimizing the performance of the power stations. An ad hoc training project offers technicians and engineers from the Congolese national company the opportunity to work in Italy for two years to acquire the skills necessary to manage the project independently.

EniPower also advises the Congolese government on constructing the Network Code, a collection of technical regulations governing the development of the country's electricity infrastructure. A collaboration agreement to modernize and update the Pointe-Noire medium- and low-voltage network and the high-voltage line between Pointe-Noire and Brazzaville, the country's capital, was signed with the Société Nationale Energetique, the Congolese Ministry of Energy, and an Italian private utility known for its expertise.

The construction of medium-voltage stations will ensure that electricity will be supplied not just to the main Congolese cities, but also to numerous smaller towns.

² In 2009 only the 37% of the population of the Republic of Congo had access to electricity.

Main projects for enabling access to electricity in Congo

<p>Centrale Electrique du Congo (CEC)</p>	<p>Construction of a 30 MW, open-cycle, gas-fuelled power station set up for the construction of a combined cycle capable of increasing the potential to 450 MW.</p> <p>The power station is fuelled by associated gas from the M'Boundi deposit (Zero Flaring Project).</p> <p>The first turbo-generator has been operational since 28 March 2010 and the second since 20 November 2010.</p>
<p>Réhabilitation Infrastructures de Transport (RIT)</p>	<p>Restoration and reconstruction of the 220 kV high-voltage line from Pointe-Noire to Brazaville (550 km).</p> <p>Connection of the CEC to the national electricity network.</p> <p>Revamping and/or partial reconstruction of electricity sub-stations.</p> <p>The main CEC sub-stations have been operational since 23 March 2010.</p>
<p>Distribution network at Pointe-Noire</p>	<p>Project aimed at renovating and expanding the medium- and low-voltage distribution network at Pointe-Noire</p>
<p>Centrale Electrique de Djeno (CED)</p>	<p>Project to double the capacity of the Djeno power station from 25 MW to 50 MW.</p> <p>The power station has been operating since 23 December 2008, and the turbines have been using gas from M'Boundi since 1 April 2009.</p>

Energy as an enabler to tackle other development challenges

eni is designing a so-called Hinda Integrated Project, a community investment project integrating initiatives aimed at promoting a sustainable and equitable development at the local level, in turn contributing to the company's social license to operate and providing indirect support to the operational processes.

The Hinda project is an example of integrated intervention made possible by the partnership agreement between eni, the Government of the Republic of the Congo and the Congolese civil society. The project was launched last November 26 during an official ceremony attended by the stakeholders involved in the project.

Enabling access to energy for local communities in the Hinda district (about 40 kilometers northeast of Pointe Noire) could be a key enabler to ensure the sustainability of the other project activities, as it would guarantee a permanent and steady access to the essential services for the communities (water and sanitation, school and education, health, infrastructure, and energy).

In Congo, the Hinda District, like in every rural area in Africa, presents highly disaggregated demand patterns for cooking fuel, electricity, mechanical power, and transportation. Meeting this dispersed need often requires very different basic energy technologies, system designs, billing systems and other features than are necessary or viable in urban and peri-urban areas. This can be further complicated by the higher levels of poverty that usually prevail in rural areas. For rural, cash-poor areas, energy services may require delivery in smaller, more portable, less expensive units that help to meet what may be a more dispersed and intermittent need.

These complex barriers can be overcome, most notably through international cooperation. Equally important is a clear understanding that local communities must be deeply involved in the planning, execution, and end-use of energy services. Energy access interventions must be guided by the awareness of the local communities' unique situations and needs. The scale and nature of the access gap³ and locations involved means that electricity will need to be provided through both centralized and decentralized energy technologies and systems.

The Hinda Integrated Project's social intervention and industrial programs tries to integrate the following elements within one single model:

- *Grid extension*: An extension of the existing transmission and distribution infrastructure to connect communities to power.
- *Mini-grid access*: Linking a local community to a small, central generating capacity, typically located in or close to the community. The power demand points are linked together in a small, low-voltage grid that may also have multiple smaller generating sources.
- *Off-grid access*: Generating capacity provides power for a single point of demand, typically a solar household system.

³ Access can be provided either at the community or household level. For example, community level access will initially be provided to health clinics, education facilities and central recharging facilities that can be used for battery-powered devices such as light-emitting diode (LED) lights or cellular phones. Similarly, public productive capacity could be created, for example by providing access to electricity or mechanical power for basic irrigation or for simple cottage industries such as basic manufacturing or agricultural processing. In other cases, it may be quicker to provide some level of electricity access directly to households. These different levels and types of access are not necessarily sequential, and depend on the local context and priorities.

Looking ahead

The investment that eni allocates annually to this type of initiatives is considerable and funded internally through a specific budget line. eni does this out of an ethical commitment to sustaining local development, but also with the aim of supporting its business in Congo both in terms of social risk mitigation and brand enhancement.

eni, in partnership with The Earth Institute at Columbia University, is developing a system of monitoring and evaluation of the abovementioned activities in view of measuring the actual value of the activities implemented with respect to the contribution to the Millennium Development Goals, and in particular to the improvement in living conditions of the community.

Based on its experiences in Nigeria and Congo, eni is looking to replicate this model of associated gas use to other countries, with agreements having been drawn up in Mozambique, Ghana, Togo and Angola.

More information

View a 4-minute video on eni's work in the Republic of the Congo by clicking on this link: http://youtu.be/BDvSk_QKli4

