

Republic of the Congo Associated Gas Utilization Study

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Thanks to Albert Bressand for his thorough peer-review



**Columbia Center
on Sustainable Investment**

A JOINT CENTER OF COLUMBIA LAW SCHOOL
AND THE EARTH INSTITUTE, COLUMBIA UNIVERSITY

Summary of findings

Weak legal regulation
for APG use

Weak enforcement and
confidential agreements

No Domestic Market

2 APG Projects: Eni IPPs

- Very little legal regulation surrounding Associated Petroleum Gas (APG) use in the country. Took until 2007 for a ban on flaring to be declared in a country, whereas oil has been in production since the 1970s. No explicit fiscal incentive framework around APG use
- Compounding the problem: enforcement is weak and the only investment agreements leading to APG use are shrouded in opacity
- No real domestic market for gas in the country (mostly hydro-based – domestic power sector), with only some LPG consumption for cooking
- Only APG use projects: Eni's Centrale Electrique du Djeno (CED) and Centrale Electrique du Congo (CEC)



The statistics of APG flaring in Congo Brazzaville: How bad is it?

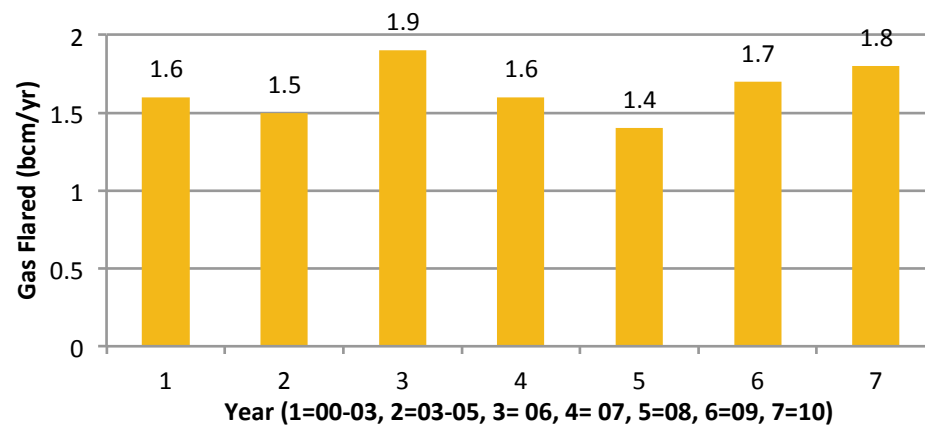
Overview stats on
APG flaring

On the companies
involved

Over the last
decade

And their flaring
trend over time

**Gas Flared (bcm/yr) in Congo
Brazzaville 2000-2010**



Source: GE, 2011

- 🔴 Congo Brazzaville has the 5th largest proven oil and gas reserves in SSA.
- 🔴 Flaring is not on a decreasing trend.



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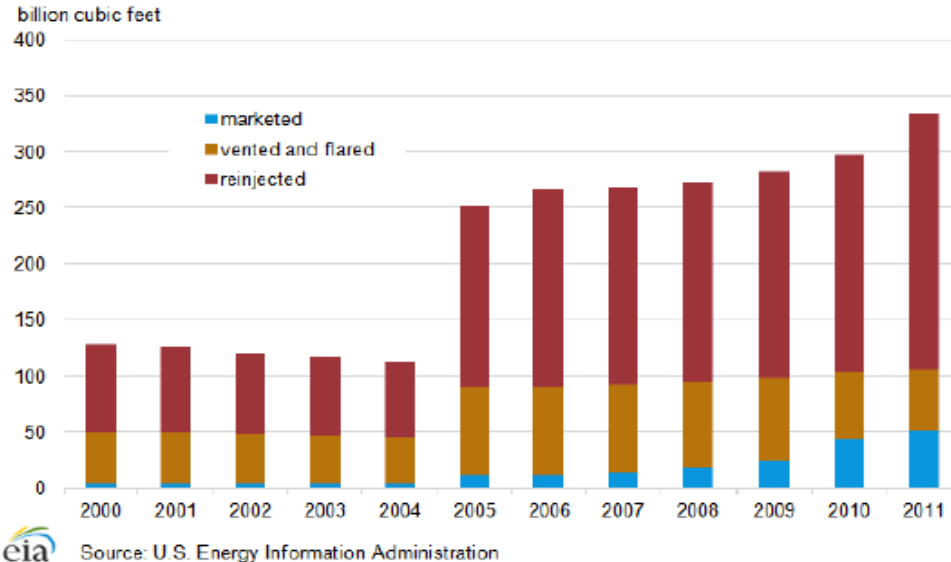
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Gross natural gas production in Congo (Brazzaville), 2000-2011



- Of the 334 billion cubic feet (bcf) of natural gas produced in 2011, about 68% (some 228 Bcf) was reinjected to enhance oil production with 17% (some 55 bcf) flared or vented and 15% mostly used for power generation.
- Although reinjection for oil recovery remains the primary use of APG in Congo Brazzaville, there has been a resurgence of interest in the past few years in the use of current flared gas for power generation.

The statistics of APG flaring in Congo Brazzaville : Who is involved?

Overview stats on
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- 2 IOCs, Total and Eni, dominate the petroleum sector.
- Total: 40% of the country's oil production in 2010. 31 MMcf/d of APG produced from its Moho-Bilondo and Nkosso oil fields reported in 2011
- Eni: 30% of country's oil production and is the country's foremost natural gas producer. Eni's associated gas production used for reinjection and power generation has increased from 67.9 MMcf/d in 2010 to 120.5 MMcf/d in 2012. Eni has made the most notable attempts at APG use in the country so far.



What is the legal and fiscal framework in place to stop flaring and incentivize APG use?

Regulation:
Agencies and
analysis

Regulation: Legal
framework and
analysis

Regulation: Fiscal
framework and
analysis

Government institutions involved in regulation of oil production/flaring	Description
Ministry of Mines, Energy and Water Resources	Charged with overall regulation of the oil and gas industry in Congo Brazzaville
Societe Nationale des Petroles du Congo (SNPC)	National oil company, charged with managing government's shares and interests in petroleum industry. In practice, SNPC's interest in the oil blocks is capped at about 20%.



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Regulation/Policies on Gas Flaring/APG use	Description
2007/2012 Flaring Ban	Ban on flaring instituted in 2007 except with special permission from the Ministry. To obtain those permits, need to justify flaring and turn over environmental impact study to govt. 'Final' deadline for flaring in the country is set at 2012.
(Private Agreement)	On obtaining a majority stake in the M'Boundi oil field, Eni signed an 'Accord Particulier M'Boundi' that gives the company ownership of associated gas.



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- 🔴 Definition and boundaries not followed
 - Only as of 2007 was any law prohibiting flaring made in the country
 - Last flare out date was set for 2012 and subsequently not met
- 🔴 Weak monitoring and enforcement of little regulation
 - Lack of systematic measurement and reporting of gas flaring figures
 - Confidential ancillary agreements between oil companies and government further muddy the regulatory landscape
- 🔴 Regulatory Approval
 - Lack of an independent regulator and transparency regarding flaring approval



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Fiscal Framework on Gas Flaring/APG use	Description
	No explicit fiscal framework surrounding APG use



What power needs could the flared gas satisfy?

Power
Generation (IPP)

Liquefied Natural
Gas (LNG)

Natural Gas
Liquids (NGL)

Gas to Liquid
Conversion (GTL)

- Significant gas reserves, made up of mostly offshore gas
 - Proven reserves at 3.2 tcf as of 2011
 - Total gas production at 334 bcf in 2011 ,with only 41 bcf consumed domestically (12.2%)
- Only about 37% of the population have access to electricity as of 2009. Power sector is still recovering from the country's 1997-99 civil war.
- Natural gas and in particular APG is only recently being considered as a viable option for power generation since about 78% of the electricity was sourced from hydroelectric dams with only 22% sourced from gas fired or thermal plants as of 2010.
- However, Eni's recent APG-fueled IPP constructions have placed the spotlight on the potential of APG for improving the country's power situation.



What are some current APG use projects that could serve as a blueprint for future projects?

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Generation (IPP)

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- The most significant APG use projects in Congo Brazzaville are 2 IPP projects from Eni - the CEC and CED power stations.
- The collaboration between Eni and the Congolese government around those clean CDM projects have generated skepticism regarding ENI's motivations (see next slide).



APG use company case study: Eni CEC project (IPP)

Power
Generation (IPP)

Liquefied Natural
Gas (LNG)

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Conversion (GTL)

Project Participants

- Centrale Electrique du Congo (CEC) is a joint venture: Congolese govt (80%) Eni (20%)

Project Description and Motivation

- Operational in 2010 with a capacity of 300 MW and possibility of expansion to 450 MW through the installation of steam turbines- expected to contribute to over '80% of the country's electricity requirements'
- To fulfill its responsibility to build and maintain the transmission and distribution lines for the plant, the Congolese government has contracted the private company Dietsmann
- The CEC project is just 1 of 4 parts of a 2008 draft agreement covering a 3 billion euro investment over many years (the other 3 include permits for tar sands exploration, a 'food plus biodiesel' project, and social initiatives aimed at improving infant healthcare in the country's rural areas).
- Listed as a CDM, it was reportedly concurrent with the 2nd part of the agreement allowing for permits for tar sands exploration in the Tchikatanga and Tchkatanga-makola regions, spurring concern over the motivation for APG use (the CEC APG use project serving as a direct carbon 'offset' to the high polluting tar sands production).
- End users : mainly industrial consumers in Point-Noire and Brazzaville

Project Location

- Near the Djeno oil terminal close to the Cote de Mateve coast in the Pointe Noire area

Associated Gas Use

- APG supply of 70 mscf/d from the M'Boundi onshore field



APG use company case study: Eni CED project (IPP)

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Project Participants

- Major stakeholders include Eni and the Congolese govt. The CED plant is run by a company named Societe Congolaise de Production d'Electricite (SCPE), a parastatal providing electricity to the public utility SNE

Project Description and Motivation

- At about the same time as the construction of the new CEC power, again coinciding with the signing of a deal agreement concerning tar sands between the Congolese government and Eni, Eni doubled the capacity of its Centrale Electrique de Djeno (CED) thermal power station from 25 MW to 50 MW.
- Established by Eni in 2002 and expanded to 50MW plant in 2008

Project Location

- Near the Djeno oil terminal close to the coast and near the CEC power station

Associated Gas Use

- The station is reported to receive a gas supply of 25 mscf/d from Eni's M'Boundi field.
- In 2002, the project was the first example of use of associated gas for power generation and was carried out with ChevronTexaco.

Project Technology

- The technology includes 2 gas fired power plants, with a total capacity of 50 MW



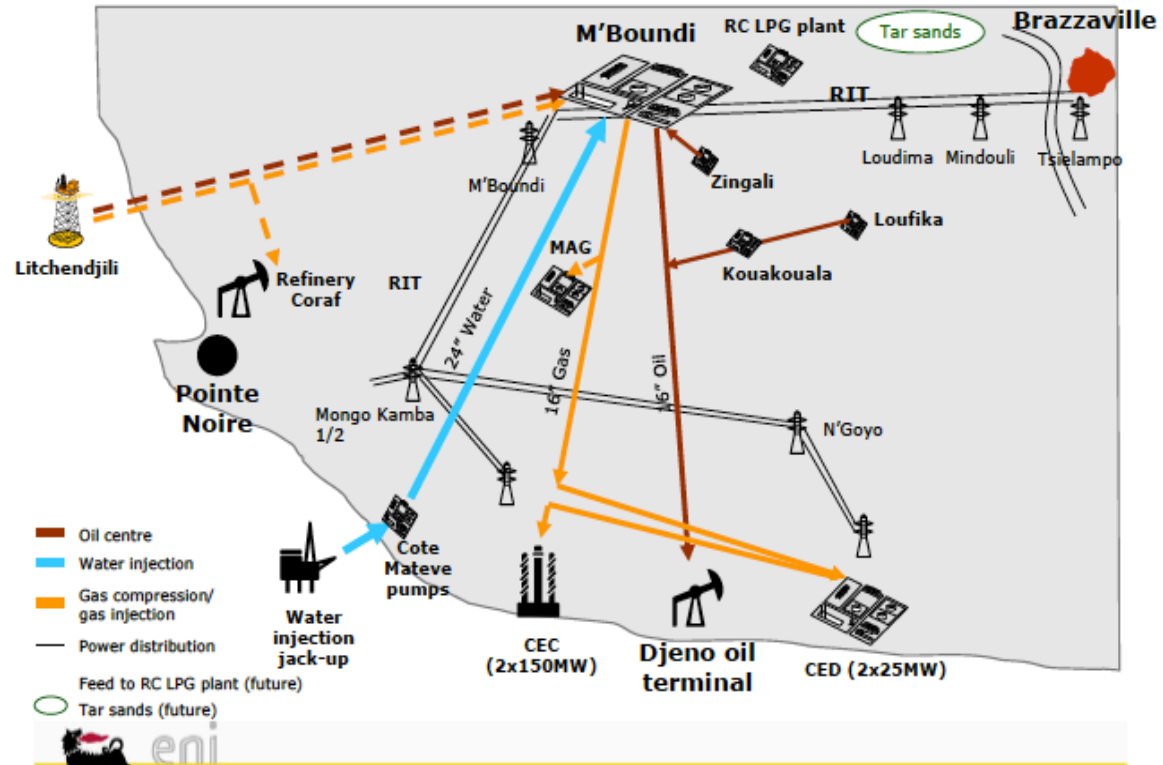
APG use company case study: Eni CEC project (IPP)

Power Generation (IPP)

Liquefied Natural Gas (LNG)

Natural Gas Liquids (NGL)

Gas to Liquid Conversion (GTL)



Source: Eni, 2011

Figure: Schematic showing locations of Eni's CEC and CED IPP projects



References

- ◆ "15th Africa Oil, Gas & Minerals Conference & Exhibition, 2012." *Oil Gas Mine Trade & Finance*. Oil Gas Mine Trade & Finance, 2 Apr. 2012. Web. 26 Jan. 2014. <http://www.ogtfafrica.com/15thOilGasMine/overview.htm>.
- ◆ "Dietsmann Wins Contract to Maintain Independent Power Plant in Cote Mateve, Congo." *Dietsmann*. Dietsmann, 18 May 2011. Web. 26 Jan. 2014.
- ◆ *Eni Congo Field Trip*. Rep. Eni, 5 Oct. 2011. Web. 26 Jan. 2014.
- ◆ Farina, Michael F. *Flare Gas Reduction*. Rep. GE Energy, Oct. 2010. Web. 25 Jan. 2014.
- ◆ "GGFR Partners Cut Flaring, Use Gas to Electrify Homes." *Global Gas Flaring Reduction*. The World Bank, 24 Oct. 2012. Web. 26 Jan. 2014.
- ◆ "Oil & Gas Tax Guide for Africa 2013 A Quick Guide to Oil and Gas Tax Regimes in Some of Africa's Fastest Growing Countries." *PwC*. PricewaterhouseCoopers (PwC), 2013. Web. 26 Jan. 2014.
- ◆ "REDUCING CARBON AND FLARING INTENSITY: EXPANDING ACCESS TO MODERN ENERGY SERVICES." *UN Business*. United Nations, 13 June 2013. Web. 26 Jan. 2014.
- ◆ *Rural Electrification: Republic of Congo Project Appraisal Report*. Rep.: African Development Bank Group (AFDB), 2012. Web. 26 Jan. 2014.
- ◆ "U.S. Energy Information Administration - EIA- Congo (Brazzaville)." Congo (Brazzaville). U.S. Energy Information Administration – EIA. Web. 25 Jan. 2014.
- ◆ Wykes, Sarah. *Energy Futures? Eni's Investments in Tar Sands and Palm Oil in the Congo Basin*. Rep. Heinrich Boll Foundation, Nov. 2009. Web. 26 Jan. 2014.

