



SHELL IN NIGERIA **GAS FLARING**

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Why it happens

In many oil fields, large volumes of gas are produced with crude oil when it is brought to the surface. This is particularly true in the Niger Delta where much of the oil is light and has a high proportion of this 'associated' gas.

When The Shell Development Company of Nigeria Limited (SPDC) built many of its first production facilities in the 1950s, there was little demand or market for gas in many parts of the world, including Nigeria. So, associated gas (AG) was usually burned off safely – a process called flaring. This remained accepted industry practice as SPDC established a major oil operation across the Niger Delta.

Since then, demand for gas in Nigeria and other countries has grown. Technology to harness, liquefy and export natural gas to distant markets has become commercial and climate change has become an increasingly important issue. Today, most people agree that continuous flaring of associated gas must be reduced significantly. It contributes to greenhouse gases that cause climate change. It is a waste of resources that could help fuel development. And it represents lost revenue for the government and oil companies.

What is Shell doing to stop flaring?

SPDC has been a pioneer in harnessing natural gas in Nigeria since the 1960s when it was the first Nigerian company to supply gas to the domestic market. More recently, SPDC has undertaken a huge multi-year programme to install equipment to gather associated gas from its facilities across the Niger Delta. Since 2000, SPDC and its joint venture partners have spent more than \$3 billion on associated gas gathering infrastructure. SPDC's total flaring dropped by around 65% between 2002 and 2009 (from about 0.6 bcf/d to about 0.2 bcf/d, representing a drop from about 14.4 mtpa to about 5.2 mtpa in CO₂ emissions) - although recent production losses in SPDC have contributed to this.

The gas gathering programme has been delayed by funding shortfalls from the major government shareholder and security concerns which meant it was not safe for staff to work in large parts of the delta for long periods of time. However, SPDC

and its partners continue to invest in reducing flares and have resumed work on many delayed projects and started new ones. SPDC is currently improving or installing associated gas gathering (AGG) facilities at 19 flowstations. In late 2009, projects were sanctioned to install AGG facilities at a further seven flowstations. When all this work is completed it will cover more than 75% of SPDC's production potential. In total these projects represent an investment of over \$2 billion.

Finding funding solutions

As part of the Nigerian government and Shell's desire to improve funding for gas projects, SPDC agreed arrangements with the Nigerian National Petroleum Corporation (NNPC) in 2008 that would allow progress on some projects through the use of bridge loans and modified carry agreements. These agreements make funds available from SPDC to NNPC. One project that is currently benefiting from this is the Gbaran-Ubie integrated oil & gas project in Bayelsa State. Planned for completion by 2010-2011, the project is expected to produce at its peak around one billion standard cubic feet of associated and non-associated gas per day, some of which will be used for domestic power generation, in addition to significant production of oil and condensates.

Supplying gas to customers

Producing gas is only half of the story; the gas needs customers as well. Shell helped to pioneer the massive Nigeria Liquefied Natural Gas (NLNG) plant on Bonny Island – one of the largest consumers of gas in the country. NLNG currently accounts for approximately 10% of global LNG capacity, establishing Nigeria as a leading LNG supplier to various customers around the world and earning the country substantial additional revenues. The plant, in which Shell has a 25.6% shareholding, was started up in 1999 and processes associated and non-associated gas. Today, SPDC still supplies over 70% of the domestic gas market, mainly for power generation, and continues to increase its contribution. In 2008, SPDC began producing electricity from the newly-built Afam VI power plant, increasing Nigeria's electricity capacity by about 15-20%. The plant is powered by gas from SPDC's Okoloma gas plant which opened in 2008 and has the capacity to increase the nation's gas supply by approximately 20%.



SPDC's Gbaran Ubie integrated oil and gas project will help reduce continuous flaring of associated gas from nearby fields.

The approximately 65% reduction in gas flaring in SPDC's operations between 2002-2009 is equivalent to about 9.2 million tonnes of CO₂ saved a year.

Health

In general, flares were originally located away from where people were living. However, attracted by economic opportunities, communities have since grown around some areas of our operations. In any case, SPDC flares are designed to be clean (smokeless) and in walled environments with no radiation impact outside the bund walls. And the low-sulphur content of Nigerian crudes means that flare emissions have a low sulphur dioxide content.

Some critics argue that flaring damages the health of these local communities, but there is no evidence to support this. The World Bank published a report in 1995 which found that the environmental and health impact of gas flaring was low. The report concluded that any negative effects of flaring were confined to the immediate vicinity of the flare and would have little or no impact on the health of the local population.

More information on the operations of Shell companies in Nigeria can be found at shellnigeria.com

The way forward

To encourage further investment and to boost the supply of gas to domestic consumers, Nigeria needs a comprehensive and flexible gas infrastructure that allows for distribution to various customers. It also needs a stable fiscal and robust commercial framework to make it profitable for investors. SPDC is working with government and other operators to help develop this framework. Also, as a member of the Nigeria Flares Reduction Committee, which is facilitated by the World Bank, SPDC and other operators are collectively working with all pertinent government agencies to look for other ways to reduce gas flaring.

Impacts of gas flaring

Worldwide over a 12-year period ending in 2006, flaring declined in 16 countries, mainly in Latin America and Africa, according to estimates from the World Bank's Global Gas Flaring Reduction Partnership and the US National Oceanic and Atmospheric Administration (NOAA). Nigeria's reduction was the largest, with a decrease of 10 billion cubic metres per year. At the same time, however, flaring rose in 22 countries. The biggest increase was in Russia, where the amount of gas flared rose by 10 billion cubic metres per year, followed by Kazakhstan and Iraq. Russia is now the world's largest gas flarer, burning twice as much as Nigeria.