

INTERVIEW

Sub-Saharan Africa Could See Its LNG Exports Almost Triple by 2040,

Fatih Birol, the IEA's Chief Economist, tells AOG

- ▶ The pace at which resources are developed is highly dependent on above-ground circumstances
- ▶ Due to rising domestic demand, we expect that the net contribution of oil exports from Sub-Saharan Africa is set to decline substantially
- ▶ The loss in revenues linked to oil theft in Nigeria is estimated at about \$5 billion per year
- ▶ Since the early 2000s, investment in Sub-Saharan African energy supply has more than doubled to \$65 billion/year since 2006

(Below is the text of an interview with Mr. Fatih Birol, Chief Economist of the **International Energy Agency** - see his CV on the following page. This interview is about the *Africa Energy Outlook*, which was published on 13 October and is part of the *World Energy Outlook* series; website: www.iea.org).

Arab Oil & Gas: *According to the IEA, about 30% of global oil and gas discoveries over the past five years were made in Sub-Saharan Africa. This region remains largely underexplored. Do you think that this part of the world will remain in the mid to long-term a very significant source of hydrocarbon discoveries?*

■ **Fatih Birol:** Sub-Saharan Africa is expected to remain an important actor of oil markets and to become a new relevant one for natural gas. Recent discoveries have changed the traditional perception of Africa's role in oil and gas sectors, with traditional, mainly West African, sources of supply being joined by new resource holders, such as Kenya and Uganda for oil, and Mozambique and Tanzania for natural gas. With the exception of few selected areas, the region remains largely under-explored with significant upside potential concentrated mainly in offshore areas, in particular the sub-salt plays all along the West Africa coast and sedimentary basins off the East Coast (which have already proved to be particularly rich in natural gas resources). The chances that Africa could be home to future important discoveries remain high, although the pace at which exploration activities will continue hinges on a mix of elements, including fiscal regimes, property rights, oil and gas international prices as well as the possibility to move faster from exploration phases to the development ones.

AOG: *Regional oil production would increase from 5.7 million barrels per day in 2013 to more than 6 million b/d in 2020 before falling to 5.3 million b/d in 2040. Regarding the potential of this region this projection could seem a little pessimistic.*



Photo AIE.

■ **F. B.:** While the region has been in recent years home to several discoveries, the development of those resources continues to face several hurdles. Nigeria, the largest oil rich country, is a key example as affected by persistent regulatory uncertainty (due to the long delayed Petroleum Industry Bill), unrest and military activity in the Niger Delta and oil theft. However, given the resource base and the endowment with relatively accessible and cheap oil, we expect its production can be maintained at significant levels throughout the projection period. There are also several other countries with oil potential such as Ghana, Sudan, Kenya, Uganda etc., but the fields are often small and relatively difficult to produce and, in the case of some onshore resources, difficult to bring to market.

Overall we believe Sub-Sahara Africa is set to remain a mainstay of global oil markets but the message is also that the move from relatively low-cost exploration to multi-million or billion dollar commitments for field development and infrastructure should not be taken for granted. The pace at which resources are developed in practice is highly dependent on above-ground circumstances, national regulation and taxation, as well as cooperation with neighbours. Nevertheless we recognise the potential for upside to our oil projections *in primis* due to the prospect for large discoveries in the "sub-salt" plays all along the West Africa coast, which though have not yet concretely materialised.

AOG: *According to your projections, Sub-Saharan Africa's contribution to the global oil balance would be sharply reduced because its **oil demand** would double to 4 million b/d by 2040. This would be an important evolution for the region but what could be the impact on the international oil market?*

> Dr. Fatih Birol

Chief Economist, Director, Global Energy Economics, International Energy Agency, Paris

Dr. Fatih Birol is the Chief Economist of the **International Energy Agency** in Paris. He is responsible for the IEA's flagship *World Energy Outlook* publication, which is recognized as the most authoritative source of strategic analysis of global energy markets. He is also the founder and chair of the **IEA Energy Business Council**, which provides a forum to enhance cooperation between government and industry.

Dr. Birol has been named by *Forbes Magazine* among the most powerful people in terms of influence on the world's energy scene. He is the Chairman of the **World Economic Forum's** (Davos) **Energy Advisory Board** and has served as a member of the UN Secretary-General's 'High-level Group on Sustainable Energy for All'. He is the recipient of numerous awards from government and industry for his contribution to energy and climate economics. Most recently, in 2013, he received the Japanese Emperor's Order of the Rising Sun, the country's highest honour. He has also been decorated by the governments of Austria (Golden Honour Medal), France (Chevalier dans l'Ordre des Palmes Académiques), Germany (Federal Cross of Merit), Iraq, Italy (Order of Merit of the Republic), the Netherlands, Poland, Turkey, the United States and the Russian Academy of Sciences. He is a past winner of the **International Association of Energy Economics'** award for outstanding contribution to the profession.

Prior to joining the IEA in 1995, Dr. Birol worked at the **Organisation of the Petroleum Exporting Countries** (OPEC) in Vienna. A Turkish citizen, Dr. Birol was born in Ankara in 1958. He earned a BSc degree in power engineering from the **Technical University of Istanbul**. He received his MSc and PhD in energy economics from the **Technical University of Vienna**. In 2013, Dr. Birol was awarded a Doctorate of Science honoris causa by **Imperial College**, London. He was made an honorary life member of Galatasaray Football Club in 2013.

Source: IEA.

■ **F. B.:** Countries in the west coast of Africa (mainly Nigeria and Angola) have been traditionally large exporters of crude oil to international markets. As a result of the tight oil boom in the United States (which is of a quality similar to the one produced in west Africa), trade patterns of crude oil exports from the region have been changing substantially being diverted from the United States to Europe, and looking forward towards Asian markets.

Due to the rising domestic demand, we expect that the net contribution of crude oil exports from Sub-Saharan Africa is set to decline substantially. This is also accompanied by rising imports of oil products, although by 2040 around 800 kb/d [800,000 b/d] of new refinery capacity is going to be built in the region and some of existing capacity will be upgraded. Overall, developments in Sub-Saharan Africa mean that the region contributes to the expected trend of a reduction in internationally-traded crude oil with importing countries set to become more dependent on a few traditional producers, in particular the Middle East, and emerging ones such as Brazil and Canada. For the region itself, the increased reliance on imports of oil products brings with it some important hazards in terms of security of supply and vulnerability to potential disruptions.

***AOG:** Annual gas regional output would increase from 58 billion cubic meters in 2012 to 230 bcm in 2040 and Mozambique would account for 60 bcm in this production rise. Will Sub-Saharan Africa become more and more a gas power rather than an oil power on the international scene?*

■ **F. B.:** In our projections, Sub-Saharan Africa is set to emerge as an important gas producer providing a relevant contribution to international gas markets and fuelling the domestic energy needs. Beside the traditional producing countries in west Africa (led by Nigeria, where gas output more than doubles over the projection period due to the progressive reduction of flared gas and the development of the huge non-associated gas resources) the centre of gas production shifts eastwards with the enter into production in the 2020s of the vast discoveries off Mozambique and Tanzania. The size of these developments and remoteness of their location raises questions about how quickly production can begin, but given their favourable location compared to the large gas importing regions, such as South Asia and Europe, I expect that export terminals are going to represent the anchor projects for the exploitation of such resources, providing significant revenues to the domestic economies. While the region as a whole sees its LNG exports almost triple by 2040, about half of the overall increase in total gas output goes to domestic power generation and industry.

***AOG:** 150,000 b/d of oil could be presently lost in Nigeria due to oil theft. What is the source of such a high figure?*

■ **F. B.:** The Niger Delta region, the area where a significant part of Nigerian oil and gas production comes from, is characterised by unrest and militant activity which results both in oil theft and sabotage to the energy infrastructure. This is an issue symptomatic of problems that stretch well beyond the energy sector, involving governance, corruption, the lack of adequate provision in the region of basic services as well as weakness of part of institutions. The result is multi-faceted: the consequent loss in revenues – around \$5 billion a year – would be sufficient to fund universal access to electricity in the country (while more than half of population currently lacks it); the insecurity conditions of the region have significantly contributed to discourage investments and the criminal activity is cause of oil spillage which has severely compromised the environment in the Niger Delta.

In order to raise the attention towards this issue we propose a set of recommendations which – if implemented properly – would deliver significant improvements, including:

the enhancement of pipeline protection, measurement and monitoring; the implementation of control activities in order to avoid that the stolen oil can reach the markets; and more intelligence activities on the financial flows associated with the stolen oil. Overtaking this issue could unleash the great potential of Nigeria, with large benefits for the entire economy and all the country's inhabitants.

AOG: *We can read in the Africa Energy Outlook that two out of three dollars put into the Sub-Saharan energy sector since 2000 were committed to the **development of resources for export**. How could, or should, this ratio change by 2040?*

■ **F. B.:** Over the last three years we have already noted a significant scale up of the investments in projects aimed to improve the energy supply in the region and between now and 2040, we expect that the trend experienced since 2000 is going to be reversed with two out of three dollars invested in energy projects devoted to produce energy for Sub-Saharan consumers. The key driver relies in the recognition of governments that the poor state of national energy infrastructure is a major obstacle to the prospects for development; reforms and large-scale investments in power generation are moving ahead – often more slowly than hoped or anticipated, but nonetheless there are signs of progress. An example is Nigeria's Roadmap for Power Sector Reform that is bringing new investors and owners to the power sector, or the various projects (in Nigeria, Ghana, Liberia, Kenya, Ethiopia, Tanzania) that are being supported under the US Power Africa initiative. The key is to have well-designed strategies, and then the capacity to follow through and implement them in practice. However, while we expect this represents a major improvement, the fast-expanding energy system continues to struggle in keeping pace with the demand placed in it, still leaving by 2040 hundreds of millions of people without access to modern energy services.

AOG: *According to the Africa Energy Outlook \$3 trillion could be invested in the Sub-Saharan energy sector by 2040, which means about \$110 billion per year, an annual figure which would be twice the one registered since 2000. What are the main conditions which could allow such a level of investment to be effective?*

■ **F. B.:** Since the early 2000s, investment in Sub-Saharan Africa energy supply has already more than doubled in real terms from around \$30 billion per year to an annual average of \$65 billion since 2006. However this trend of investment has been primarily driven by energy projects aimed to supply international energy markets rather than domestic needs. The necessary condition to change this trend and to achieve the step-change in capital flows is the government action to create sufficient opportunities for investment. This challenge goes well beyond the energy sector, involving a reduction of the risks arising from macroeconomic or political instability and from weak protection of contracts and property rights. As mentioned, we have encouraging signs from a number of Sub-Saharan states which have developed awareness about the need to improve the investment framework and levels of governance as key pre-requisites to develop more modern energy systems.

AOG: *Half of the increase in electricity generation to 2040 would come from **renewable energies**. There is no doubt that the potential is there but will finance be available?*

■ **F. B.:** Renewable energy technologies are very important in Africa, particularly large-scale hydropower and geothermal for on-grid applications and other renewables, including solar PV, small hydro and wind, in off- and mini-grid applications. Africa is endowed with a lot of renewable energy potential – solar resources are among the best in the world across nearly all

of the continent, vast hydropower potential exists across large areas of Africa south of the Sahara Desert, along with world-class geothermal resources in East Africa and wind potential in various locations. Raising the capital required to bring about the scale of renewables deployment in our projections will be a challenge, largely dependent on continued economic growth and stable governments. Regional cooperation and good governance will also be critical to creating a reliable investment environment.

As economies within Africa continue to grow, there will be more financial resources available to invest, which in turn will spur on greater economic growth in a virtuous cycle. There is also a great deal of foreign interest in Africa – China is, for example, already very active in large-scale hydropower developments. Furthermore, we note a widespread interest from the international community to assist rural communities to gain access to electricity, and there are many opportunities to support this goal by assisting in the development of mini- and off-grid systems, that may be the only option to gain access for many of these people.

***AOG:** The IEA stresses that three issues should be at the heart of future energy policies in the region: an **upgraded power sector**; deeper **regional cooperation**; and a **better management of resources and revenues**. Are you rather optimistic about the two latest issues? And do you see today or in the recent past interesting developments towards progress in these areas?*

■ **F. B.:** Regional cooperation is an important part of Africa's vision for its future, but we recognise that here, as in many parts of the world, there is a large and persistent gap between the potential gains and the actual record of achievement. Examples of successful cross-border co-operation and cross-border infrastructure are relatively few and far between. The regional power pools are a partial exception but they are still often poorly interconnected in practice. At the root of the problem is that, while many countries are happy to see themselves in the role of energy exporter, few are ready to rely on imports for more than a small share of their domestic needs, because of doubts about the reliability of supply or the political consequences of import dependence. For these reasons, we assume only a gradual improvement in regional cooperation and integration in our main scenario, which means that much of the potential remain unutilised. Without the regional market dimension, countries can be locked into less efficient – and more expensive – generation options. This constraint is though lifted in the African Century Case, where regional projects move ahead much more quickly, making possible additional investments in electricity projects for a total of \$130 billion and leading to a tripling in cross-border electricity trade.

As far as the better management of resources and reserves is concerned, we expect a progressive improvement in the governance and transparency related to the management of the oil and gas sectors with also the declared aim to reduce the risks facing investors and the benefit of a larger inflow of fiscal revenues. In the African Century Case, where improved conditions allow for a higher level of investment and consequently more sustained production, fiscal revenues are set to reach \$200 billion by 2040, or 20% higher than in our New Policies Scenario. Such additional revenues become available to finance a faster pace of infrastructure investment, providing with an additional contribution to overall economic growth.

☞ See also in this issue ***African Oil*** on page 34.