# Sudan

Last Updated: September 2011

## Background

***Oil revenues are important to the economies of North and South Sudan but the sector's development is hindered by conflicts and sanctions.***

Sudan has been involved in several conflicts since its independence in 1956 that have impacted the country's economic development, particularly its natural resources. The most recent conflict, Darfur (2003-2010), brought with it international condemnation, internally displaced populations, and sanctions affecting the country as a whole. The conflict has prevented oil exploration in the Darfur region, and the sanctions have prevented some international investment. The fighting itself has led to considerable infrastructure damage further limiting development.


Source: CIA World Factbook

The longest of the two wars was between the Northern Sudanese government in Khartoum and the government of the South (1956-1972 and 1983-2005). The North/South civil war ended with the signing of the Comprehensive Peace Agreement (CPA) that was in place from 2005 through 2011.

As part of the CPA, a referendum took place in January of 2011 during which the people of South Sudan voted to secede from the North and in July 2011, Sudan became two countries: Sudan and the Republic of South Sudan. Abyei, a significant oil producing region on the North/South border was also expected to carry out a referendum in January to determine which side it would join, but this did not take place and uncertainties regarding the status of Abyei remain. Other territorial disputes along the North/South border continue, specifically in the areas of South Kordofan and Blue Nile where clashes have taken place.

Oil plays a major role in the economy of both Sudans. According to the International Monetary Fund, oil represented over half of government revenue and 90 percent of export earnings for North Sudan. For South Sudan, oil represented 98 percent of total revenues. Under the CPA, South Sudan was given some degree of autonomy from the North but revenues from oil produced in South Sudan were shared equally. Most of Sudan's oil is produced in what is now the South (about 75 percent, depending on specific field allocations), but the entire pipeline, refining and export infrastructure is in the North.

In the near-term, both countries will remain co-dependent in terms of the oil industry. The loss of oil revenues will have a serious impact on the economy of North Sudan at a time when it is still facing international sanctions—while land-locked South Sudan is dependent on the North to export its crude. At the time of writing, both countries had yet to come to an agreement regarding transit fees. The North was seeking fees that would offset the loss of its 50 percent share of the

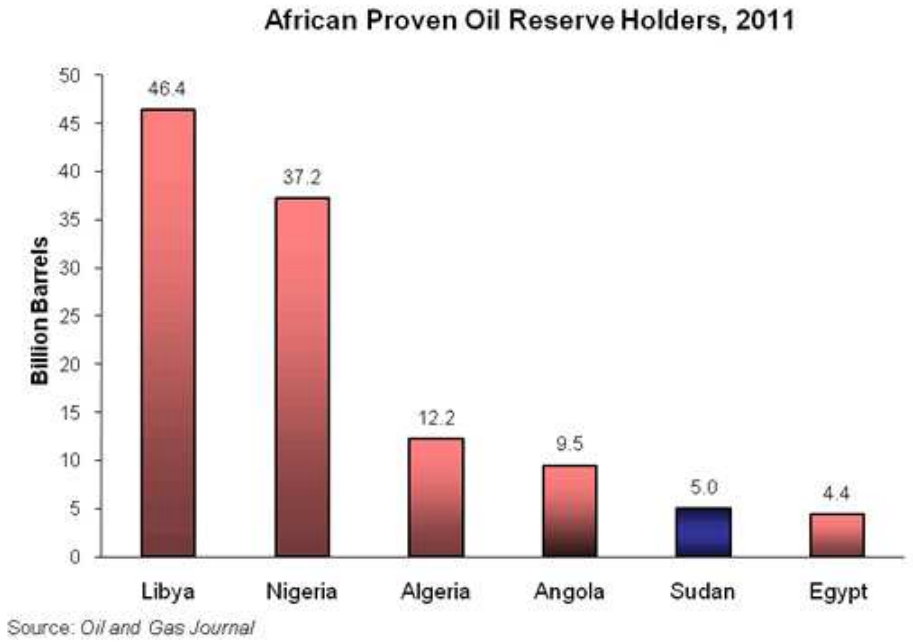
South's revenue and was most recently reported to be charging about $23-33/bbl, while the South was seeking terms that were more in line with international standards (below $1/bbl) and offering to sell the North discounted oil. South Sudan was also in talks with interested companies to create a possible export pipeline through Kenya but this would take 2-3 years to build and its development will depend on the terms of any agreement between the governments of South Sudan and Kenya, as well as interested companies.

According to the International Energy Agency (IEA), combustible renewables and waste accounted for 68 percent of Sudan's total primary energy consumption in 2008, followed by petroleum (32 percent) with hydroelectric power accounting for a small share. The large share of biomass in the energy mix represents a large population, located in rural areas with little or no access to the electricity grid, that relies heavily on biomass to meet heating and cooking needs. According to the IEA, approximately 27 million people in Sudan lack access to electricity, the country as a whole has a 36 percent electrification rate with urban areas accounting for half of the population with access.

## Oil

***Most of Sudan 's oil is produced in the South, but the pipeline, refining and export infrastructure is in the North of the country.***

According to *Oil and Gas Journal* (*OGJ*), Sudan had five billion barrels of proved oil reserves in January 2011, up from an estimated 563 million barrels in 2006. Other analysts put reserve estimates as low as 4.2 (Wood Mackenzie) or as high as 6.7 billion barrels (BP 2011 Statistical Review). The majority of reserves are located in the in the Muglad and Melut basins. Due to civil conflict, oil exploration has mostly been limited to the central and south-central regions of the country. Natural gas associated with oil production is mostly flared or re-injected. In 2009, there were announcements of natural gas discoveries in Sudan but these have yet to be determined commercially viable.




Exploration and development of Sudan's oil resources has been controversial. International human rights organizations have accused the Sudanese government of financing human rights abuses with oil revenues, including the mass displacement of civilians near the oil fields. Factional fighting and rebel attacks on oil infrastructure have kept oil production and exploration from reaching full potential. China National Petroleum Corporation (CNPC), the largest investor in Sudan, has had workers and facilities attacked while at the same time, China has faced international condemnation for its investments in Sudan.

### Sanctions

The United States prohibits U.S. nationals from engaging in any transactions or activities related to the petroleum or petrochemical industries in the entire territory of Sudan (including Southern Sudan) as a result of the conflict in Darfur. For information on full U.S. sanctions, please see the U.S. Treasury Department's Office of Foreign Assets Control. Sudan also faces sanctions from the United Nations and the European Union which include arms embargos, travel bans, and restrictions on financial activities that may impede the peace process – without specifically addressing the petroleum sector (the full list of U.N. sanctions can be found here).

### Sector Organization

The Sudan National Petroleum Corporation (Sudapet), North Sudan's national oil company, is active in the country's oil exploration and production. However, due to its limited technical and financial resources, Sudapet often develops joint ventures with foreign companies in oil projects but remains a minority shareholder. North Sudan is planning to carry out a licensing round for blocks in the northern and western (Darfur) part of the country.

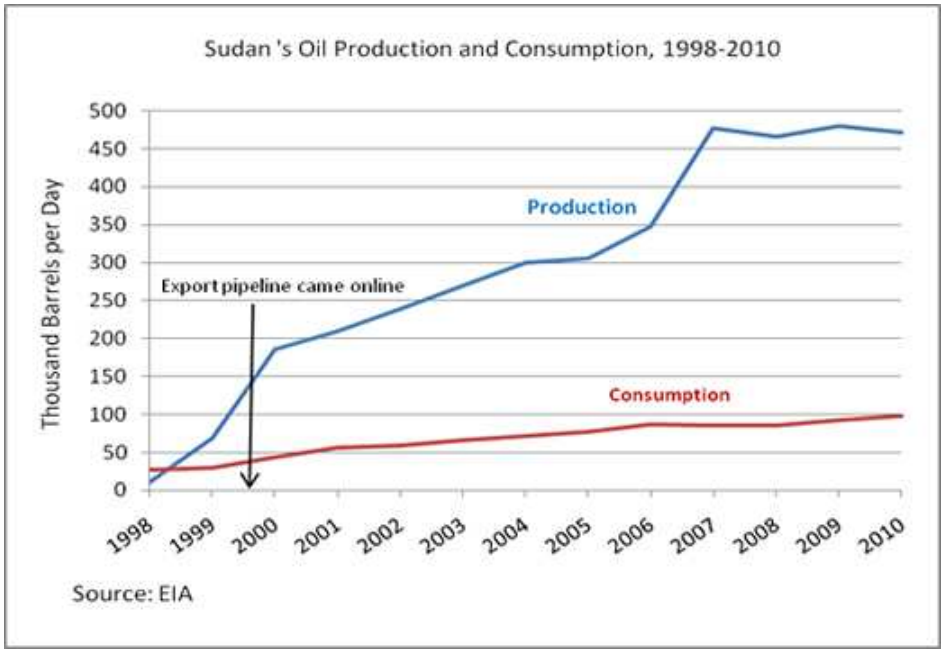
Nilepet is South Sudan's national oil company but its role has yet to be fully determined. At the time of writing there had been no stated changes in production sharing agreements, contract terms, or oil sector policies.

Foreign companies involved in Sudan's oil sector are primarily from Asia. They are led by the CNPC, India's Oil and Natural Gas Corporation (ONGC) and Malaysia's Petronas.

## Exploration and Production

Oil production began in the late 1990s and grew rapidly starting in July 1999 with the completion of an export pipeline that runs from central Sudan to the Port of Sudan. In 2010, EIA estimates that crude oil production averaged just over 470,000 barrels per day (bbl/d). First half 2011 data indicate a slight decline, averaging about 460,000 bbl/d. As a result of uncertainties regarding security and boundary issues, there has been limited additional investments in the oil industry. EIA's Short Term Energy Outlook forecasts a decline in overall Sudanese production based on declines in existing fields.

Production is sourced from two groups of blocks in addition to output from smaller, newer areas that have recently come on-stream (detailed descriptions are listed below). The first and oldest development is the Greater Nile Oil Project covering Blocks 1, 2, and 4 that in 2010 was the source of an estimated 150,000 bbl/d of Nile Blend. The second major field encompasses Blocks 3 and 7, operated by the Petrodar consortium, which produced around 260,000 bbl/d of Dar Blend. Other smaller sources Include Block 6 which produced just over 40,000 bbl/d of Fula Blend, and Block 5a, another source of Nile blend, which produced between 20,000 and 30,000 bbl/d in 2010.




*Blocks 1, 2, and 4 – Greater Nile Petroleum Operating Company (Nile Blend)*

Blocks 1, 2, and 4 cover an area that straddles the North, South, and Abyei region. The area's borders are often in dispute. In 2009, the Permanent Court of Arbitration in the Hague ruled on a dispute that put two of Sudan's oilfields from this block (Heglig and Bamboo) in the North rather than as part of Abyei. The blocks however are collectively operated by the Greater Nile Petroleum Operating Company (GNPOC), a consortium of CNPC (40 percent), with partners Petronas (30 percent), ONGC (25 percent) and Sudapet (5 percent).

Production began in 1996 with the development of the Heglig and Unity Fields. Because the fields lacked access to markets, a consortium was developed to raise investment for a 1,000-mile pipeline from the fields to the Suakim oil terminal near Port Sudan. In September 1999, the first cargo of crude departed the export terminal.

In 2010, combined production from Blocks 1, 2, and 4, including Abyei, was estimated to be around 150,000 bbl/d of Nile blend, reflecting a decline from a 2006 peak of over 270,000 bbl/d

and is expected to continue to decline in the short-term, mainly from declines in the Heglig and Unity fields. The negotiations over the future of these fields and the Abyei region have delayed investments to offset declines.

*Blocks 3 and 7 – Melut Basin (Dar Blend)*

Blocks 3 and 7 in the Melut Basin, South Sudan, are operated by Petrodar, a consortium of CNPC (41 percent), Petronas (40 percent), Sudapet (10 percent), Sinopec (3 percent), and Tri-Ocean Energy of Kuwait (3 percent). Located in the Melut Basin, the blocks contain the Fal, Adar Yale, and Palogue oil fields. In November 2005, CNPC brought online the Petrodar pipeline linking the two blocks to Port Sudan. The pipeline has current throughput of 150,000 bbl/d and maximum capacity of 500,000 bbl/d.

In 2010, production from these two blocks was close to 260,000 bbl/d of Dar blend. The heavy and highly acidic quality of this crude makes it less marketable and it trades at a discount to other benchmark crudes such as Brent and Minas.

*Block 5a (Nile Blend)*

In April 2005, the Sudanese government signed an agreement with White Nile Petroleum Operating Company (WNPOC) for the development of the Thar Jath and Mala fields on Block 5a. First oil from the block came online in June 2006 at an initial rate of 38,000 bbl/d. In 2010, the field was still producing between 20,000 and 30,000 bbl/d, full capacity was initially estimated at 60,000 bbl/d. Oil from the field flows through a 110-mile pipeline to Port Sudan. WNPOC is a consortium of companies, which include Petronas (69 percent), ONGC (24 percent) and Sudapet (7 percent).

*Block 6 (Fula)*

In November 2004, CNPC brought online its Fula field on Block 6 at a rate of 10,000 bbl/d. Current output on the block is over 40,000 bbl/d of highly acidic crude, and is expected to increase slightly. CNPC has constructed a pipeline that links the Fula field to the Khartoum refinery where it is processed largely for domestic use.

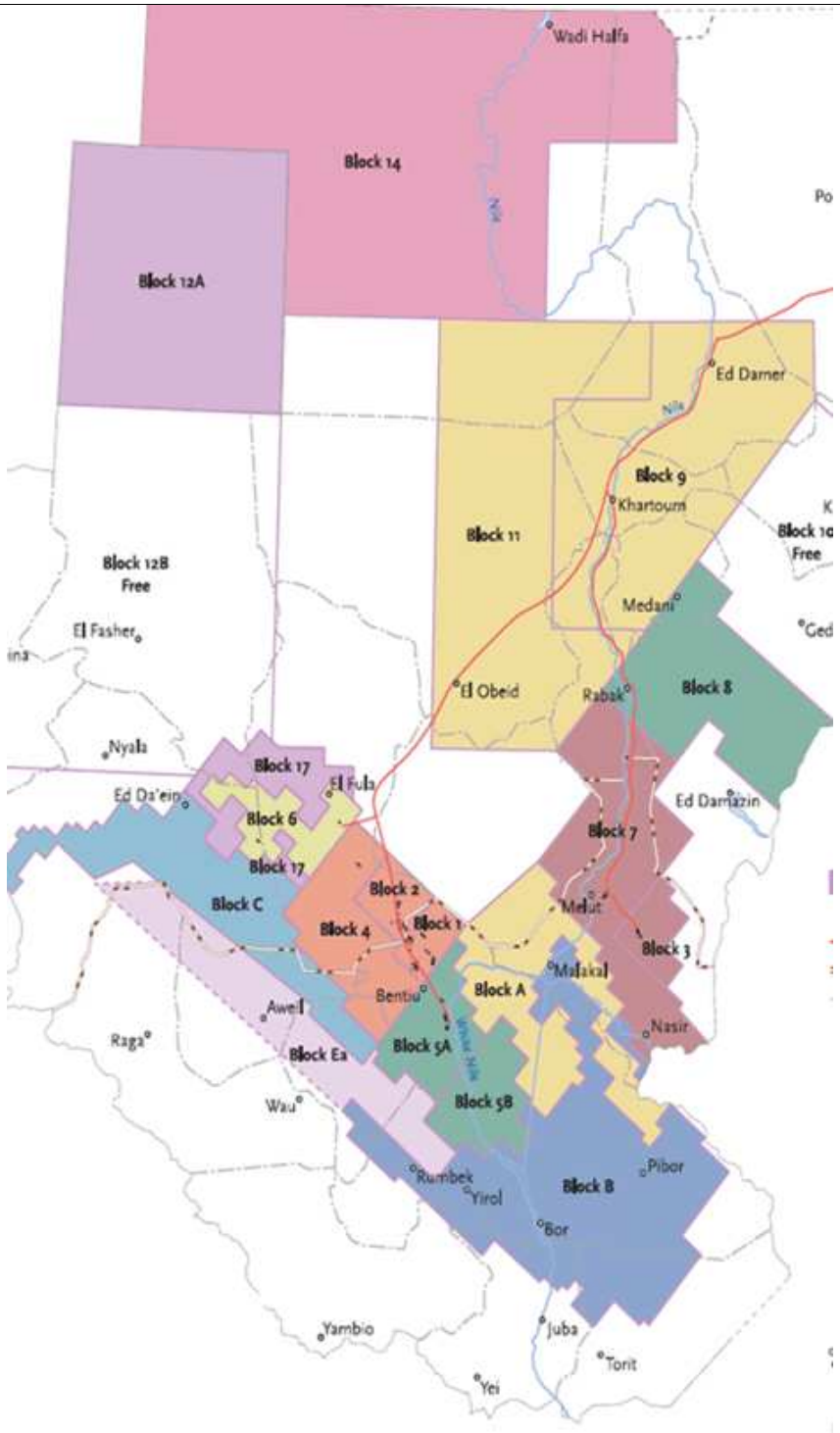
*Other Blocks*

*Block B:* Block B is located in southeastern Sudan and is licensed to Total. The company has faced several problems resulting from conflict in the area, licensing problems, and, more significantly, the existing consortium continues to seek a third partner to replace Marathon Oil, a U.S. company that was forced to pull out of its 32.5 percent interest as a result of U.S. sanctions.

*Block 5B:* Block 5B is located in the southern Muglad Basin and was initially under exploration by ONGC Videsh (23.5 percent stake) and Lundin (Sweden 24.5 percent) in partnership with Sudapet (13 percent), and Petronas (39 percent). In early 2009, two major stakeholders, ONGC and Lundin pulled out after negative drilling results. In August 2009, the National Petroleum Commission approved the participation of Ascom, a Moldovan firm in block 5B.

*Block EA:* The EA block is a relatively new block, marked out along a long narrow strip that runs along existing fields in the Muglad Basin. In August 2010 Star Petroleum (Luxembourg) announced the company was awarded an exploration and production–sharing agreement (EPSA) for Block E. Star Petroleum holds a 75 percent stake, while Sudapet holds 20 percent, the remaining 5 percent is held by Hamla (Norway).

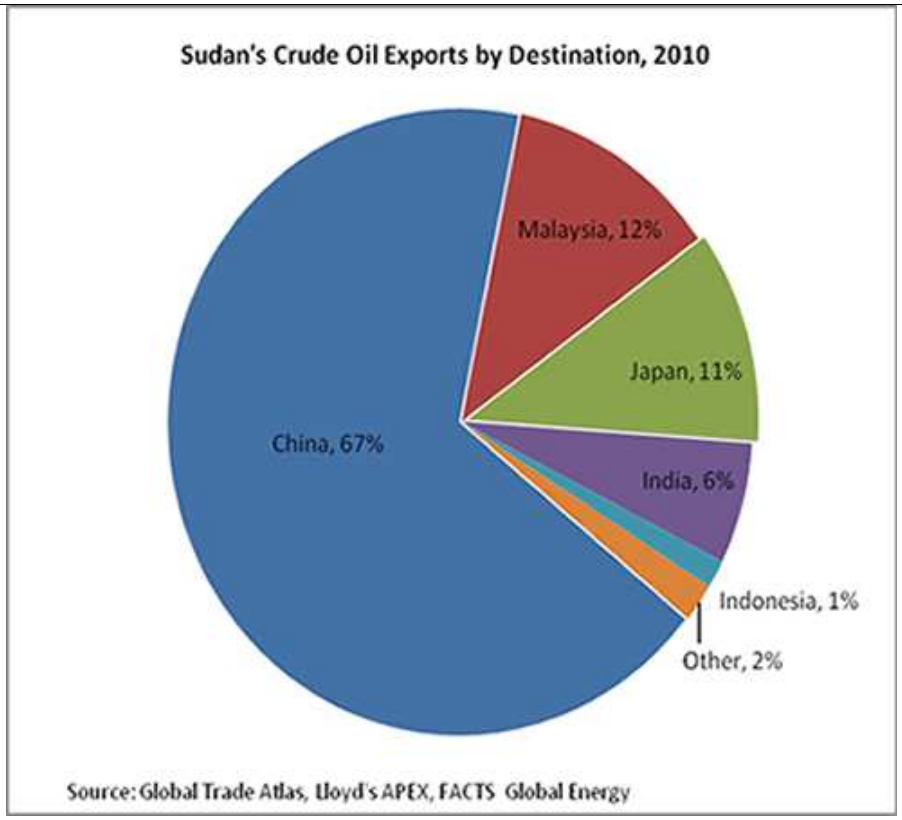
**Map: Sudan Oil Blocks (click map for high resolution and more descriptive version)**




Source: European Coalition on Oil in Sudan

## Exports

In 2010, Sudan produced just over 470,000 bbl/d and consumed around 98,000 bbl/d. The remaining crude was exported almost exclusively to Asian markets. According to international trade data, in 2010 China imported around 250,000 bbl/d (just over 65 percent of total Sudanese exports and 5 percent of Chinese imports) followed by Malaysia (45,000 bbl/d) and Japan (40,000 bbl/d). Sudan also exports some processed fuels to neighboring countries. Ethiopia imports most of its fuel from Sudan but official data on trade volumes is not available.




Sudan has two major oil streams, the Nile and Dar Blends. Nile is a medium, sweet crude with an API of 34 while the Dar blend is a heavy, sour crude. Both are exported mostly to Asian markets and trade at a discount to Indonesian Minas, the Asian benchmark crude.

### Refining

Sudan has three refineries located in Khartoum, Port Sudan, and El-Obeid. The Khartoum refinery was expanded in 2006 from a capacity of 50,000 bbl/d to 100,000 bbl/d. The expansion allowed for the processing of both Nile and Fula blends of crude for domestic consumption as well as product exports. The Port Sudan facility is located near the Red Sea and has a refining capacity of 21,700 bbl/d. In September 2005, a contract was awarded to Petronas to build a new refinery at Port Sudan. The refinery was to be designed to process the highly acidic Dar blend but this project has been postponed several times and the status is currently unknown. The El-Obeid refinery is the smallest with an estimated capacity of 10,000 bbl/d.

The government of South Sudan has announced plans to build additional refining capacity in the South and has discussed as a 2,200-mile (3,600 km) pipeline from the South to Kenya's port in Lamu.

## Links

**U.S. Government**

CIA World Factbook - Sudan
CIA World
USAID - Sudan
U.S. State Department Consular Information Sheet - Sudan
U.S. Treasury Department Office of Foreign Asset Control

**General Information**

BBC Country Profile: Sudan
European Coalition on Oil
International Monetary Fund - Sudan
U.S. Institute of Peace
United Nations Security Council Sudan Sanctions Committee

**Oil and Natural Gas**

China National Petroleum Company (CNPC)
Greater Nile Petroleum Operating Company (GNPOC)
Oil and Natural Gas Corporation (ONGC
Petrodar
Petronas

Sudapet
White Nile Petroleum Operating Company (WNPOC)

## Sources

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Business Monitor International
Economist Intelligence Unit
FACTS Global Energy
Global Trade Atlas
Global Witness
IHS Global Insight
International Energy Agency
International Monetary Fund
Lloyd's List Intelligence APEX
Middle East Economic Survey (MEES)
Oil and Gas Journal
Reuters News Service
World Bank
Wood Mackenzie

## Contact Info

cabs@eia.gov
(202) 586-8800
cabs@eia.gov