

Universo

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40 Years of Success

UPSTREAM

REVITALISING
OILFIELDS

CULTURE

LUANDA'S
ARTS FESTIVAL

SOCIAL ACTION

CHEVRON'S
CSR EXPERIENCE



Sonangol

Universo is the international
magazine of Sonangol

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Board president Francisco de Lemos José Maria at the anniversary event



SONANGOL: FOUR DYNAMIC DECADES

The fortunes of Angola and Sonangol have been intimately entwined over the past 40 years. Since its foundation on February 25, 1976, the company has been the mainstay of the country's economy. The oil industry that Sonangol leads so dynamically has accounted for more than 90 per cent of export earnings during the past four decades.

In the words of board president Francisco de Lemos José Maria, the founding of the company marked the beginning of the battle for Angola's economic independence.

The income that oil sales brought into government coffers provided the means for the newly-independent nation to maintain its hard-won status and ultimately to achieve peace in April 2002.

Since then Angola has witnessed a massive expansion in development as Sonangol has accelerated its oil output, benefiting from high crude oil prices on the global market. This has transformed the lives of many Angolans, who now have greater access to healthcare, housing, schools, energy and water supplies, as well as rebuilt highways, and improved rail and air links.

A successful oil industry, under the guiding hand of Sonangol, laid the firm foundations of the country's economy. The legacy of the company's first four dynamic decades is a healthier, better educated Angola, enjoying all the benefits of new and improved infrastructure.

John Kolodziejski

Editor

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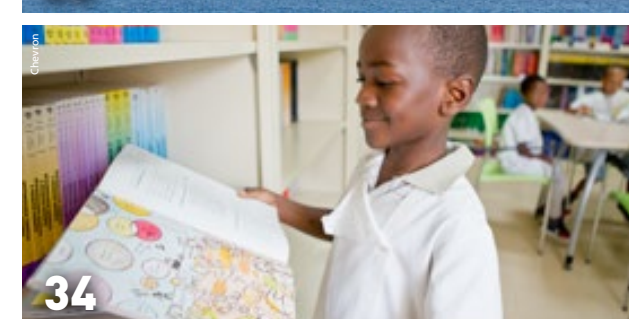
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Luanda's Triennial triumph



WELL DONE ENI

► Italian major Eni started oil production in Angola’s Mpungi field on time and within budget in January. The West Hub project in deepwater block 15/06 in Angola is located 130km west of Soyo and is expected to add around 100,000 barrels per day in the first quarter of this year.

The West Hub consists of the Sangos, Cinguvu, Mpungi, Mpungi North, Ochigufu and Vandumbu fields at depths of between 1,000 and 1,500 metres. The wells are connected to the N’Goma floating storage production and offloading (FPSO) ship.

Eni said it would continue to carry out exploration activities in block 15/06, and would link any new discoveries to existing production facilities.

The group is the block’s operator with a 36.84 per cent stake, and the remaining partners are Sonangol P&P (36.84 per cent) and SSI Fifteen Ltd (26.32 per cent).



Sonangol cleans up electronic waste

► Sonangol led a campaign to recycle electronic waste to mark Environment Day on January 31. In partnership with the Ministry of the Environment and private company NetService, Sonangol managed to collect 500 tonnes of electronic materials over a period of six days. Currently Angola’s electronic waste is exported.

Daniela Matos, Sonangol’s director for quality, safety and the environment, said the initiative was part of the company’s contribution to a healthier environment.

The campaign involved Sonangol personnel collecting waste from the Samba and Ilha areas of Luanda.

Interior minister Ângelo Tavares (centre) and environment minister Maria de Fátima Jardim with Daniela Matos, Sonangol’s director of DQSE (extreme right)



PRESIDENT OPENS LUANDA INTERCHANGE

► President José Eduardo dos Santos inaugurated a totally rebuilt road interchange in central Luanda as part of the February 4, Day of the Armed Struggle, celebrations. The Largo do Ambiente road complex project, whose development has benefited from the support of Sonangol, is located near the city’s waterfront and consists of two large roundabouts that have long been a traffic bottleneck. The rebuilt roundabouts now boast pedestrian areas and a large square. There is also underground parking for 525 vehicles. Parked cars in the area had previously been a source of congestion. The project, close to the historic Nazareth church, is part of Luanda’s ongoing renovation and is intended to provide local residents and visitors with an improved urban environment, while accelerating traffic flows.

The country’s biggest diamond



► Australian firm Lucapa Diamond Company has unearthed a 404.2-carat diamond, measuring more than 7cm in length and valued at some \$14 million, the largest ever found in Angola.

The precious stone was recovered from Block 8 at Lulo, which has already produced more than 60 such large gems since mining began in the area in August 2015, the company said. The previous largest discovery was approximately half the size of the current one at 217.4 carats. Lulo, in northeast Angola, forms part of Catoca, the world’s fourth biggest diamond mine.

Angola’s national diamond company, Endiama, said it was “a significant day for our country, for our industry and for the Lulo project.”

Endiama sold diamonds worth \$1.1 billion in 2015, and its board chairman, António Sumbula, predicted output should double in the next three years from its current level of 8.8 million carats per year.



Lomaum dam powers up again

► The Lomaum power dam at Cubal in Benguela province reopened on February 4 after standing still for over 30 years. The 50MW dam, built in 1959, will improve power supplies to over 92,000 people in Benguela, Lobito, Catumbela and Baía Farta.

Lomaum, which had restarted commercial production on an experimental basis in June 2015, is located on the River Catumbela, about 200km southeast of Benguela. The dam had been inoperative since 1984.

Recovery and modernisation were carried out in 2009 by the Guangxi Hydroelectric Construction Bureau Angola, in partnership with Kanazuro Electric, who will now operate the dam for 20 years. The project also utilised 145km of transmission lines.



New school for Sambizanga

Sonangol funds new Luanda school

► Sonangol E.P. and its Block 17 partners, led by Total E&P Angola, opened a new secondary school in Luanda's Sambizanga district in February. The school was named Kidielela Kwa Muenho.

The new buildings were built from Block 17 funds and consist of 13 classrooms, a refectory, a laboratory, a library, swimming pools and sports grounds.

Witnesses at the ceremony included Sonangol E.P. executive administrators Anabela Fonseca and Ana Joaquina Costa, and the director general of Total E&P, Jacques Azibert. Also in attendance was Sonangol's director for corporate social responsibility, Arlete Borges.

Recent government appointments

► President José Eduardo dos Santos named four new ministers in March while also accepting the resignation of the governor of Angola's Central Bank, BNA, José Pedro de Morais Júnior. The president named Valter Filipe Duarte da Silva as his replacement.

Carolina Cerqueira replaces Rosa Maria Martins da Cruz e Silva as culture minister. Fiel Domingos Constantino takes over at the trade ministry from Rosa Escórcio Pacavira de Matos. Paulino Domingos Baptista becomes hotel and tourism minister, and Luis Gomes Sambo becomes health minister in place of José Vieira Dias Van-Dúnem. Branca Manuel da Costa Neto do Espírito Santo is the new minister for housing and urban planning.

Sonangol and Eni sign deal

► **The strategic and operational partnership between Sonangol and Eni was enhanced in December with the signing of a co-operation agreement to develop the Angolan oil industry by the Chairman of the Sonangol Board, Francisco de Lemos José Maria, and by his Eni counterpart, Claudio Descalzi.**

A major component of the agreement involves upgrading the existing Luanda refinery and developing a new one at Lobito.

The partnership also includes assessing gas resources in the Congo Basin, which could result in energy generation of up to 1.5GW for the domestic market, supporting agricultural projects with the aim of diversifying Angola's economy.

Angolan independence feted in words and music



► A literary anthology entitled *Angola 40 Years: 40 Tales*, 40 Authors and a music compilation CD *Angola 40 Years*, produced and sponsored by Sonangol, were released on February 18 in a ceremony at the Angolan Writers Union (UEA), in Luanda.

The UEA's general secretary, António Carmo Neto, presided over the ceremony.

The 380-page book and the CD pay homage to the 40th anniversary of Angola's independence. The volume includes stories by distinguished Angolan authors such as Adriano Mixinge, Albino Carlos, Aníbal Simões, António Fonseca, António Gonçalves, António Quino, António Setas, Arnaldo Santos, Augusto Alfredo, Carmo Neto, Chicoadão, Conceição Luís Cristóvão, Dario de Melo, David Capelenguela, Domingos de Barros Neto and Roderick Nehone, among others.

The disc features protest songs from the period of independence which are now evoked by other Angolan voices.



Artists honour Angola's freedom



Angola's first steel mill

► **Economy minister Abraão Gourgel inaugurated the country's first ever steel complex, Aceria de Angola, on January 16. The 500,000 tonnes/year plant at Barra do Dande, Bengo province, will help reduce the country's imports of steel rods, said minister Gourgel. Initial daily output will be 1,000 tonnes of 8–32mm rods used in building construction. Currently Angola imports around 300,000 tonnes of steel annually.**

Angola's First Lady, Ana Paula dos Santos, was also present at the opening ceremony as well as the governor of Bengo province, João Bernardo Miranda.

Banco de Poupança e Crédito (BPC) provided \$130 million of the total \$260 million investment. The project was initially budgeted at \$300 million. Next year the mill will manufacture wire rod and mesh.

The plant will absorb large amounts of locally-sourced scrap metal and will receive power from the Cambambe dam.

KAZA project tackles poachers

► The ministers for hotels and tourism of Botswana, Namibia, Zambia, Zimbabwe and the Angolan Secretary of State for the sector, Alfredo Varo Kaputo, have approved the master plan for the integrated development of the Kavango-Zambezi Transfrontier Conservation Area (KAZA-TFCA). The KAZA-TFCA project aims to protect biodiversity, promote tourism and improve the living conditions of communities.

Angola’s share of the area covers 90,000 sq km in Cuando Cubango province.

The KAZA-TFCA authorities expressed concern about the sharp increase in poaching in the conservation area, with particular emphasis on the slaughter of elephants. “These crimes against animals already have transnational aspects including the involvement of criminal organisations from other continents.” The ministers intend to organise a broader forum to engage the defence and security forces of member countries to combat the poachers.



New Sonangol concessions

► The government has awarded Sonangol operator rights to explore and develop oil and gas in an area covering 540 sq km, off Angola’s coast. The concessions include Block 2/15 (Garoupa Oeste well), Block 6/15 (Cegonha well) and Block 18/15.



On the road to Soyo

► Work on the key northern coastal highway from Nzeto in Bengo province to the important oil and gas town of Soyo in Zaire province resumed in February after several years of delays. Chinese construction firm Sinohidro, which is undertaking the project, says completion of the 96km highway is due by June 2017. China has provided a credit line to finance the project’s completion.

Nzeto is already connected to Luanda and recently had its road link to the provincial capital Caxito revamped.



Totally pumped up

► France’s Total took the first step towards opening fuel stations in Angola when its CEO Patrick Pouyanné signed a memorandum of understanding in late December. Initially Total will source products through Sonangol.

Sonangol said the deal could involve investments of hundreds of millions of dollars, with both immediate and long-term benefits. This partnership embodies the government’s strategy to liberalise trade in the sector, the company added.

Angoflex pipes for Kaombo

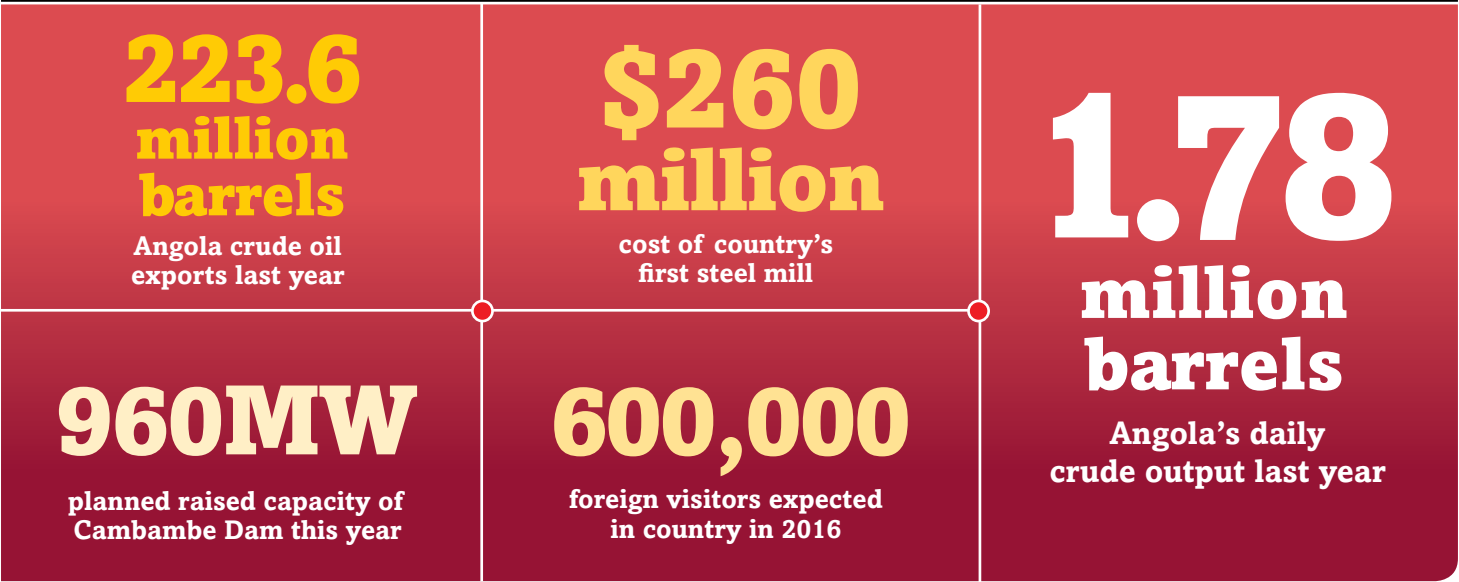
► Angoflex Industrial has begun welding rigid pipelines for the Total-led Kaombo project in Block 32. It is undertaking the work at its Barra do Dande base in Bengo province.

According to Angoflex director Isabel Paulo Nascimento, the plant will produce nine 13,500-metre pipelines with a total length of 280km, which will be deployed in six fields at depths of up to 1,925 metres.

Work on the project is scheduled to last a year and will involve a workforce which is 90 per cent Angolan.

Angoflex is co-owned by Sonangol (30 per cent) and Technip (70 per cent).

FIGURED OUT



PUMPING IS UP



Annual company results released on February 25 by Sonangol (in its 40th anniversary year) showed that crude oil production rose by 6 per cent in 2015 to a daily average of 1.78 million barrels. The rise was mainly due to increased output in new fields: Block 14 (Lianzi), Block 15 (Kizomba Satellites Phase 2) and in Block 17 (MPP Rosa and Dália 1A). This was also supported by consistent performances from Blocks 17, 18 and 31.

Oil trading conditions were increasingly difficult last year as prices plummeted. Sonangol exported 223.6 million barrels of crude at an average price of \$50 per barrel, compared to \$96.72 in 2014. Oil exports were sharply down, bringing in \$11.2 billion, half that of the previous year. Exports were also affected by lower demand as volumes declined 12 per cent.

There was better news concerning the production, import and consumption of oil products. Sonangol's Sonaref Luanda refinery produced 2,491,515 tonnes of refined oil products in 2015, up 15 per cent compared to 2014. However, this amount was insufficient to meet domestic demand of 4,864,958 tonnes, which was 11 per cent lower than in 2014.

To satisfy the country's needs, oil product imports reached 5,040,021 tonnes, a 5 per cent fall compared to the previous year. The decline in consumption was mainly a consequence of higher domestic fuel prices as the state reduced consumer subsidies.

Meanwhile, Angola's natural gas production dropped 8 per cent to 507,293 tonnes in a year when the LNG plant at Soyo continued to be out of service.

Sonangol's receipts totalled 2,297 billion kwanzas

(AKZ) last year, one-third down on the preceding period. The reduction in oil takings was partially compensated for by an increase in income from refining, distribution and fuel sales. Angolan fuel retail price rises in January and April last year also boosted Sonangol's revenues.

However, company earnings before interest, tax, depreciation and amortisation (EBITDA) declined 45 per cent to AKZ1,247 billion, while the net figure fell from AKZ139.2 billion in 2014 to AKZ44.1 billion in 2015.

The main factors affecting Sonangol's net profits in 2015 were a fall in crude prices and impairments to oil production assets such as dry wells and/or non-commercial discoveries. On the plus side, Angola's retail prices rose and operational costs fell. Profits were

also impacted by currency rates as the kwanza depreciated and was devalued.

Sonangol's net debt increased 41 per cent to AKZ1,239 billion as the company maintained its intensive investment plans.

Despite adverse oil market conditions, Sonangol E.P. met all its financial creditor commitments and continued its investment programmes while making some necessary adjustments. It spent a total of AKZ565.2 billion with 82.1 per cent going to exploration and production, 7.6 per cent covering logistics and distribution, 5.1 per cent on refining and transport, and 4.8 per cent for non-core businesses.

The business performances of subsidiaries Sonangol P&P and Sonagás were those most affected in 2015 by lower crude and natural gas prices and

the fall in value of their oil and natural gas assets. Their losses were estimated at more than \$3 billion.

Prospects

Despite believing 2016 will be a very difficult year for the company with a substantial reduction in the price of crude, Sonangol expects to raise its oil output. It also envisages its results and financial performance will remain under strong pressure.

Company initiatives taken in 2015 to reduce costs will be enhanced this year with the revision of some investment projects and the possible option of disposing of non-core assets and businesses. This may allow Sonangol to maintain the conditions for balanced finances and give it the margin needed to continue investing. **U**

Despite adverse oil market conditions, Sonangol E.P. met all its financial creditor commitments and continued its investment programmes while making some necessary adjustments



Sonangol's board with chairman Francisco de Lemos José Maria (centre)

SONANGOL RETROSPECTIVE

Universo looks back over 40 years and describes how a fledgling oil firm has blossomed into one of the leading energy powerhouses in Africa today

Sonangol celebrated its fortieth anniversary on February 25. Over the past four decades the Angolan state-owned oil company has become a world-class outfit, and is highly respected by its peers and business partners. It is by far the largest and most influential enterprise in Angola's economy.

Oil output
Under Sonangol's stewardship, Angola's oil and gas output has come on in leaps and bounds, especially over the past 20 years, as operations have moved further offshore to exploit the nation's rich deepwater hydrocarbon assets.
Sonangol is the sole concessionaire charged with exploiting oil and gas in Angola's subsoil and continental platform. It is a fully integrated company which manages all fuel production and distribution in the country. Core business activities include prospecting, research, development, marketing, production, transportation, storage and refining. These tasks are undertaken alone or in collaboration with foreign firms. Its partners in oil drilling include most of the top international oil names.



Above: Sonangol E.P.'s women's basketball team
Below: Sónia Anastácio, best indoor soccer player with Pedro Gomes, director of the Centro Cultural Paz Flor

Below: Gianni Martins, presented with best basketball scorer trophy





One big happy family. Board chairman Francisco de Lemos José Maria (striped shirt) in its midst

Since its founding in 1976, Sonangol has helped Angola to become the second largest oil producer in sub-Saharan Africa, with a high probability of reaching the top spot in the next few years.

By 1984, Angola was tapping 100,000 bpd (barrels per day) and this amount more than tripled by 1991. In 2004 Angola was producing 1 million bpd as drilling moved into deep waters.

Angola's output was around 700,000 bpd in 1996, when Sonangol partner Elf Petroleum (now Total) discovered the giant Girassol field in Block 17 at a water depth of 1,300 metres some 140km offshore. This discovery midway between Cabinda and Luanda surprised the oil industry because of its long distance from the coast, indicating that oil deposits were spread further afield than previously thought. Other Sonangol partners – Total, Chevron, Esso, BP and Maersk Oil – also made further finds in similar geological formations.

Thanks to deep-sea wells, growth in production has doubled since 2002, making the state a medium-

sized producer. Offshore Angola is recognised as a world-class area for oil exploration and production, making it a major deepwater player alongside Nigeria, Brazil and the Gulf of Mexico.

Today, these deep-sea wells account for more than 80 per cent of the total oil output of nearly 1.8 million bpd. Most of the crude oil is produced offshore in Block 0, located near Cabinda. Crude reserves are also present onshore around the city of Soyo, offshore in the Kwanza Basin north of Luanda and off the northern coast.

Angola gained recognition of its importance as an oil producer in January 2007 when it became the 12th member of the Organization of Petroleum Exporting Countries (OPEC).

Crude products

Angola currently produces 13 oil streams or grades with various characteristics such as viscosity, acidity and sulphur content, and thus appropriate for different refining processes and uses. Cabinda Blend is the standard type for evaluating crude



Roberto of the Girassol team receives the top goal-scorer trophy from Mateus Cristóvão Benza, head of Sonangol Department for Communication and Image

produced in Angola and is used as an international reference.

The US market has a preference for light crude, which is appropriate for gasoline, and therefore favours Nemba and Palanca streams, while crude from Kuito wells is dense, and most of it is sold to Middle East countries.

Cabinda Blend is appropriate for fuel oil and large quantities of this are sold to China, Angola's main client.

The shape of Sonangol today

Employing over 9,000 people, Sonangol is the driving force in the exploration of the country's oil and gas resources and now looks far beyond its own frontiers in expanding its operations.

Over the past four decades, the state-owned company has expanded into a group of integrated companies, comprising 17 subsidiaries which provide a wide range of services to support and promote its upstream and downstream activities. In this process, Sonangol has become Angola's leading distributor of refined products as well as a promoter of social and national human resources.

INTERNATIONAL OPERATIONS

Sonangol has expanded its core business into other activities and today is a multinational company. The headquarters are in Luanda and the company has offices worldwide.



AFRICA

Cape Verde
retail sales of refined oil

São Tomé and Príncipe
distribution and retail of refined products of crude oil



SOUTH AMERICA

Brazil
exploration, development and production of crude oil

Venezuela
exploration, development and production of crude oil



NORTH AMERICA

United States
production, marketing and shipping of crude oil and LNG



ASIA

Singapore
crude oil marketing

Hong Kong
crude oil marketing



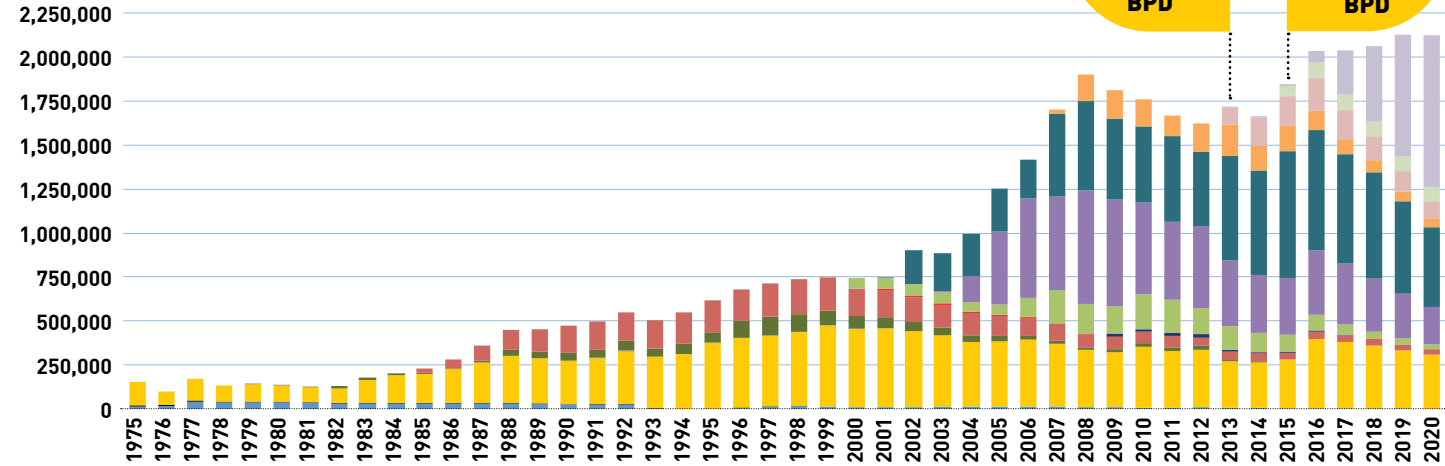
EUROPE

Portugal
refining, distribution and retail of refined oil products

UK
crude oil marketing

ANGOLA PRODUCTION HISTORY AND FORECAST

THOUSANDS
BARRELS
PER DAY



CONGO FS/FST KWANZA TOTAL BLOCK 0 BLOCK 1 BLOCK 2 BLOCK 3 CANUKU BLOCK 4
BLOCK 14 BLOCK 15 BLOCK 17 BLOCK 18 BLOCK 31 CABINDA SUL BLOCK 15/06 PROJECTS

Through its acquired experience, hard work and sustained development, the group has gained prestige and built a solid reputation in the oil industry both at home and abroad. This is a direct result of the high-quality relationships it has developed with the oil companies which operate or have interests and investments in Angola.

Sonangol's part in Angola's progress

While Sonangol's priorities are the management of hydrocarbons, environmental protection and industrial safety, the company also performs a broader role in Angola's economic and social development. The oil industry it leads provides most of the country's income and underwrites ambitious infrastructure projects such as new power dams, highways and railways as well as water supply, education and enormous housing schemes.

All international oil company partners are obliged to train local staff through the country's Angolanisation policy, which aims to have native workers make up at least 85 per cent of personnel at all levels. These companies must also use their organisational know-how to promote economic, social and educational projects through corporate social responsibility budgets, often as a condition for Sonangol-managed oil exploration concessions.

Local content laws have also meant that more oil-related activities are undertaken in Angola using local workers and manufacturing plants.

In recent years, Sonangol's oil concessions have sourced sophisticated equipment such as topside units for rigs and umbilicals in-country. Angolan suppliers have increasingly provided engineering, maintenance and other oil industry

support services. A greater share of further education and vocational training related to the oil industry is also now undertaken at home where Sonangol's Academia subsidiary has a leading role.

The availability of Angolan universities and training centres, such as the oil industry-focussed marine training centre at Sumbe, means fewer locals need to study abroad.

A result of all these initiatives has been more widespread economic activity across the country, especially along its seaboard: Cabinda, Soyo, Ambriz, Barra do Dande, Sumbe and Lobito.

Through its fuel distribution wing, Sonangol Distribuidora, the company has ensured its presence is felt in every corner of the country, with over 600 service stations providing petrol, diesel and in many cases, convenience stores.

The aviation arm of the company, SonAir, also provides regular flights across the country.

A wide-angle view

In order to reduce vulnerability to fluctuations in the oil market, Sonangol has sought to diversify its activities and has taken on a leading role in other areas of the economy, akin to that of a development agency. The company has used its administrative skills to bolster embryonic enterprises. A good example of this aspect has been SIIND, a branch which at one time operated as an incubator for new industrial developments. Some of the industries it supported are linked to ancillary oil services and the manufacture of drilling equipment,

fibre optic cables and specialist paints, while others fulfil other key elements for the country's industrial renaissance such as electronic, telecommunications and irrigation equipment, packaging as well as construction materials.

In addition, Sonangol, through its Sonip subsidiary, has had a huge impact on the building of large-scale housing developments throughout Angola. The jewels in the crown are the now thriving Kilamba Kiaxi and Zango districts of Luanda that are home to some 200,000 people.

The group is justly proud of its environmental record and has set a high standard for others to emulate. Remarkably, since commercial oil production began in 1956, there has never been a major accident or oil spill in Angola, a state of affairs Sonangol is determined to maintain.

Sonangol also has a strong commitment to the preservation of natural resources in the areas where it operates.

A major Sonangol-backed undertaking with great environmental benefits is the \$10 billion, 5.2 million tonnes per year LNG (liquefied natural gas) plant at Soyo, inaugurated in 2012. The project not only aids sustainable development by ending the wastage of a precious resource, but also cuts Angola's carbon emissions.

Looking ahead

By every quality measure, Sonangol has progressed since its creation in 1976. It has expanded to meet the demands of its clients for more fuel at home and abroad, while its revenues have benefited Angola by financing the total renewal of the country's infrastructure.

The company has been the moving force behind the nation's extraordinary economic growth in recent years and will continue to play that role in the future. **U**



Races celebrate Sonangol's 40th birthday

Long-distance runner Simão Manuel, of athletics club Clube Desportivo 1º de Agosto, won the 15km Luanda road race celebrating Sonangol's 40th anniversary. Manuel led a field of 3,500 runners, which included top athletes, veterans and the general public. His time of 47 minutes and 56 seconds was enough to gain the 200,000-kwanza prize.

The race began at Sonangol's headquarters and passed by the port area, before doing a long loop along the Ilha peninsula, which encloses Luanda Bay.

Ernestina Paulino of Interclube won the women's prize with a time of 55 minutes and 46 seconds.

A 5km fun race was also organised for families. One participant was 73-year-old Ernesto Bastos who said he was happy to have managed to pass the finishing line when many did not.



Administrators Anabela Fonseca and Ana Joaquina da Costa help board chairman Francisco de Lemos José Maria cut Sonangol's birthday cake



SONANGOL GROUP SONANGOL E.P. SUBSIDIARIES

CORPORATE & FINANCIAL

Sonangol Finance Ltd
financial services

EXPLORATION & PRODUCTION

Sonangol P&P
oil exploration

**Sonangol Hidrocarbonetos
Internacional**
oil and gas operations abroad

Sonangol Gás Natural (Sonagás)
natural gas exploration

**Empresa de Serviços e
Sondagens de Angola (Essa)**
construction, operation and
maintenance of onshore and
offshore drilling rigs as well
as survey services

REFINING & TRANSPORTATION

Sonangol Shipping
crude oil and
LNG maritime transport

Sonaref
refining

DISTRIBUTION

Sonangol Logística
logistics

Sonangol Distribuidora
oil products distribution

**Sonangol Comercialização
Internacional (Sonaci)**
oil, gas and product marketing

NON-NUCLEAR BUSINESS

SonAir
oil and gas industry
air transport service

MSTelcom
telecommunications

Sonangol Holdings
investments

**Sonangol Investimentos
Industriais (Siind)**
industrial investment

**Sonangol Imobiliária e
Propriedades (Sonip)**
property development

Clínica Girassol
healthcare

Academia Sonangol
training

Aiding Angola's economic independence

The board president of Sonangol E.P., Francisco de Lemos José Maria, said the founding of the company in 1976, marked the beginning of the battle for Angola's economic independence. He was speaking during the main event commemorating Sonangol's 40th anniversary.

He emphasised the fact that over four long decades it has been possible to build and preserve an impressive oil company. He also said that the current battle is for the consolidation of the company's many victories for the good of the sector and of the country.

According to the president, notwithstanding the current difficult and complex situation, it was still possible to be profitable in 2015, despite their falling compared with 2014.

The official Sonangol 40th anniversary ceremony took place in the presence of administrators, members of executive commissions and corporate directors at the company's head office in Luanda on February 25.

The high point of the event was the presentation of diplomas of merit and special gifts to workers who have completed 40 years' service with the company in 2016.

Administrator Fernando Roberto, in his role as activities co-ordinator of anniversary commemorative events, stressed the importance of the date (the company being founded on February 25, 1976) and described the activities that marked the occasion.

The event celebrated the publication of two books: *Sonangol 40 years*, a work that narrates in the first person the tales of indispensable figures in the company's history, and *Origins*, which portrays the preservation of traditional characteristics of some Angolan ethnicities.

The board president awarded the general culture prize to Elma João. He also presented the national basketball champions' trophy and the Africa Clubs Champions Cup for 2015 to Petro Atlético de Luanda.



Francisco de Lemos José Maria admires the basketball trophy

The current battle is for the consolidation of the company's many victories for the good of the sector and of the country

– Francisco de Lemos José Maria
Sonangol board president

Sonangol's current headquarters dwarfing its original offices (right)

SONANGOL'S TIMELINE

1976 Nationalisation of Angola's oil and establishment of state-owned Sonangol UEE

Angola oil production 100,000 bpd

1983 Institution of the company's first international subsidiary, Sonangol Ltd (London)

1991 First oil concession granted in deep waters in Block 16

1992 Establishment of subsidiary Sonangol P&P as an oil exploration company

1996 Elf Petroleum (now Total) discovers Girassol field in deepwater Lower Congo Basin at a water depth of 1,300 metres

1999 Sonangol UEE changes its statutes and becomes Sonangol E.P.

First floating production, storage and offloading (FPSO) vessel on stream in Angola (Project Kuito, Block 14)

Elf in Angola in September 1987

2001 Girassol production begins at a rate of 200,000 bpd

2003 Sonangol P&P starts operations in Block 03

2004 Angola oil output reaches 1 million bpd

2007 Chevron Block 0 begins production

2008 Angola oil production averages 1.9 million bpd

Sonangol opens new HQ in Luanda

2009 ExxonMobil and partners reach 1 billion barrels of cumulative oil production from deepwater Block 15

2011 Total and partners achieve 1 billion barrels cumulative oil from deepwater Block 17

Sonangol awards 11 pre-salt blocks in deepwater Kwanza Basin

2012 Maersk Oil makes first deep-water pre-salt oil discovery in Kwanza Basin

Cobalt also makes pre-salt find

Chevron, Sonangol and partners accumulate 4 billion barrels of oil output in Block 0

2013 Angola makes first LNG delivery (to Brazil)

2015 Angola marks 100 years of oil drilling

2016 Sonangol celebrates 40 years

WEATHERFORD WATCHING

Angola hosts a range of international oil service companies. *Universo* spotlights Weatherford Services, one of the world's top five

As wells reach ever greater depths and are more likely to be offshore and in increasingly extreme environments, drilling for oil and gas has become a very sophisticated business. A number of companies have developed techniques and tools to provide the specialist, often ingenious services required for a wide variety of locations and geological

conditions. Weatherford Services is one such company.

The firm serves all the major oil players in Angola: Chevron, Total, BP, Esso and Cobalt, as well as Sonangol P&P. The technology it uses has brought a great deal of success to all international oil companies, said Weatherford's country director, Domingos Freitas.

For example, the retrieval of drills and debris from deep wells known as 'fishing', may save an oil producer between \$100,000 and \$1 million per day in lost operating and production time.

A one-stop shop for oil drilling companies, Weatherford has its head offices in Houston, Texas. It has been very active in Angola since 1999 and is

WHAT DOES WEATHERFORD DO?

Weatherford's service divisions comprise Formation evaluation and well construction, and Completion and Production. Altogether they total 15 specific types of service.

Formation evaluation and well construction

This division includes drilling and its tools, tubular running services (TRS, well casing and well shaft reinforcement), wireline services (cables to control tools and monitor wells), testing and production services, re-entry and 'fishing', cementing, well liner systems, integrated laboratory services and surface logging.

Completion and production

This area includes artificial lift systems and well completion systems. The latter offers tools for flow control systems and well screens, as well as reservoir monitoring.

Weatherford's best-selling service is its TRS, an area in which the company is a recognised leader worldwide as well as in Angola.

It is also the only provider of managed pressure drilling services in the country. Leading its product sales are liner-hangers (proven technology and applied in a difficult environment in Angola). A liner-hanger is a device to position an oil well liner, which is used to create a vacuum in the final stage of completing a well for pumping.

Domingos Freitas,
Weatherford country director

CASE STUDY: SONANGOL P&P

Weatherford has worked closely with Sonangol P&P, often to tight schedules. On one occasion Sonangol P&P needed TRS for a completion at Well Gazela 101 within a timeframe of two weeks. Owing to the presence of CO₂ (carbon dioxide) and H₂S (hydrogen sulphide) in the field, chrome pipe was selected by the operator and so specialist equipment to handle and run the chrome completion was required.

In response, the Texan firm supplied, prepared and provided a TRS package for the completion, using high-tech equipment that was made immediately available. Once the equipment was serviced, it was checked by Sonangol representatives and given satisfactory feedback. The job was run smoothly and the completion was installed within the well programme. The solution offered also preserved the integrity of the pipe as no insert marks ('jaws') ended up on the surface of the pipe, thus ensuring proper pipe preservation in the well.

The job was critical as it required specialist handling and running equipment for the chrome pipe. Weatherford provided a proper solution and ran the job successfully while meeting the short deadline.



one of the top five oil service companies in the world. According to its 2014 annual report, competitors include Schlumberger, Halliburton, Baker Hughes, National Oilwell Varco, Cameron International, Noble Energy and Nabors Industries.

"Weatherford is a service company specialising in oil and gas, dedicated to maximising the value of clients' natural resources; it's one of the largest in the world for products and services including drilling, evaluation, execution, production and in oil and natural gas well intervention cycles," Benguela-born country operations manager, Walter Costa, told *Universo*.

Sonangol has engaged Weatherford for major TRS operations as well as fishing. The supplier has two bases, one at Viana (covering 3 hectares) near Luanda and another in Malongo. It is building a newer facility in Cabinda (8 hectares).

The company currently employs 510 staff in Angola, of which around 75 per cent are nationals.

"We provide unique technology to oil companies around the world, and they have the same needs here as they do abroad. They also want the same success in Angola. The jobs created by Weatherford support 385 Angolan families," said Domingos Freitas.

Hands-on training

As regards training, Weatherford has nurtured many engineers and offered internships to Angolans, while also transferring knowledge to engineers. The company has agreements with one local university to offer seminars, and the institution has also become a source for recruitment.

A critical corporate contribution and focus in Angola is technical training. To this end Weatherford is building a state-of

Weatherford specialises in oil and gas and is dedicated to maximising the value of clients' natural resources

– Domingos Freitas
Country Director

the-art facility at its Viana base, which will be completed this year, said Freitas.

As part of its hands-on training scheme, a full-size drilling rig has already been set up at the Viana site so that students can get a feel for the job.

This will not only improve the competency of Weatherford's own workforce but also offer practical experience to university students and the oil sector in general.

The programme planned at Viana includes running 'Introduction to the Petroleum Industry' courses once per quarter for new employees and external candidates.

Theoretical technical teaching will be provided in classrooms by company experts or by external training providers.

Practical technical training will involve the TRS test and training tower, the managed pressure drilling (MPD) flow loop and other apparatus. Angola is a prime growth market for MPD, and there is a need to invest in the development of local MPD engineers.

In light of this, Weatherford is exploring the possibility of a

co-operation agreement with the National Petroleum Institute of Angola (INP) to set up a recognised MPD training programme in Angola, said Freitas.

Mentor training

Every expatriate has to mentor an Angolan successor as part of the company's obligations to the market. An on-the-job mentor training programme teaches experienced employees how to become effective mentors and transfer their knowledge to a new generation. This is of crucial importance to Weatherford's efforts to nationalise its workforce in Angola.

The target groups for Weatherford are its own staff and native Angolan employees as investment in development of the national workforce.

The company also intends to offer training to client and Sonangol employees as well as to university students at the Viana base, especially for new technologies. Weatherford has formed a strategic partnership with a local university to provide student training and internships.



Research, development and patents

A heavyweight oil service provider, Weatherford is proud of its world-class technology and international training centres. It also invests heavily in research, development and engineering facilities with the aim of improving existing products and services, such as drilling and enhancing reservoir productivity.

Company investment in research and development is rising, with expenditure of \$290 million in 2014, compared with \$265 million in 2013 and \$257 million in 2012.

CSR

Weatherford takes its corporate social responsibility (CSR) in Angola very seriously. The company sponsors 40 pupils at a primary school in Cabinda, where it is also constructing fencing and a water reservoir for an orphanage. It is providing close to \$500,000 for an advanced patient care manikin as a human body training aid for Cabinda University's faculty of medicine.

While revamping the Viana base, the firm gained the good will of the local community by rebuilding roads and fixing drainage and power lines. This infrastructure also serves a nearby clinic and school, giving the neighbourhood easier access to health and education, mentioned Freitas.

Local partnership

The company is proud of its partnership with Cimel Oilfield Services. Through Cimel (a growing Angolan company), Weatherford has positioned itself as the foremost supporter of sourcing local content in Angola. Local content counts, local content works. 

CAREER PROGRESSION: WALTER COSTA, COUNTRY OPERATIONS MANAGER

Country Operations Manager Walter Costa has had a remarkable career at Weatherford.

After studying at university in Luanda, to make ends meet he took a job as a driver for a casing solution provider in Angola. He then worked as a workshop helper where he learnt about maintenance, cleaning, painting and testing of hydraulic and pneumatic equipment.

Costa recalled having good mentors at his first employer, with experience in a range of areas. He then progressed to being an offshore technician. In 2003–04 he then went on to do various courses abroad and acquire new skills, and worked on projects related to Blocks 31, 18 and 15. After training, he returned to sea as offshore supervisor and crew chief, and within five months was made operations co-ordinator at BP Angola, responsible for Blocks 31 and 18.

Weatherford then offered him a job as its base co-ordinator at Total-operated Block 17. He accepted the position because of the opportunities and professional experience he could acquire. After just four months he was transferred to Weatherford Asia Pacific in India, where he worked for three years both onshore and offshore.

On returning to Angola, the company made him a workshop supervisor because of his experience. In June 2009 he was named TRS Operations Supervisor managing operations in Luanda and Soyo for Sonangol, Somoil, Eni, Maersk Oil Angola and Total.

In 2012 Weatherford transferred him to Cabinda as operations supervisor, managing operations and specific projects in Blocks 14 and 0, the Congo River Crossing and Lianzi; he was also made trainee operations manager in Cabinda.

In 2014 he took on his current role as Angola country operations manager.

“A lesson that I learnt is that first you need to do what has to be done – that is, do the work in the best way possible, always respecting different cultures, races and beliefs that exist within and outside the company,” he explained.

“I also learnt as much as I could so as to have as great an experience in operations as well as in the area of administration, maybe because I dealt with the right people who were experienced in a range of sectors. Weatherford was and continues to be a great school for me and for the generations to come,” he added.

What does Costa like best about his job?

“The thing that I really like to do in our organisation is doing my work with great care, doing it well every day. I have fun and enjoy the pleasure of excellence, the aesthetic pleasure of the quality of perfection. As a manager we must be examples to be followed.

“I like the everyday interaction with colleagues, clients, commercial partners, suppliers, government regulatory organs and communities, because with this interaction we work intensely according to the situation of the current market, seeking to innovate, encourage and always have a humble posture, and including discipline as a norm,” he said.

“The principles are clear: it’s much easier to achieve professional success doing what you like.”



Walter Costa

First you need to do what has to be done – that is, do the work in the best way possible, always respecting different cultures, races and beliefs that exist within and outside the company

– Walter Costa
Country Operations Manager

IN SEARCH OF FOREIGN FIELDS

Engineer Frederico Ferraz Domingos, chief executive of Sonangol Hidrocarbonetos Internacional, outlines the company's aims and objectives in an interview with *Universo*

Engineer Frederico Ferraz Domingos



What is SHI?

Sonangol Hidrocarbonetos Internacional (SHI) is Sonangol E.P.'s subsidiary focussed on researching, prospecting and producing hydrocarbons outside of Angola. It was established in May 2012 to support Sonangol's internationalisation strategy of managing and acquiring new assets abroad. SHI also prepares and co-ordinates actions aimed at repositioning the Sonangol Group internationally.

What is SHI's corporate mission?

SHI's mission is to exploit, develop and produce liquid and gas hydrocarbons efficiently as well as profitably.

What are its main goals and objectives?

Currently the principal focus of SHI is on adjusting and resizing the company, as much from the organisational point of view as from its positioning. It seeks new opportunities to improve the quality of its asset portfolio and acts preferentially as a non-operating company. Thus SHI has as its principal strategic objectives:

- Raising the level of output to a sustainable level
- Consolidating the firm's organisation

To achieve these objectives, the following targets were set:

- Operational and production improvement
- Start development activity
- Reach the production levels expected
- Review/define business processes

What are the company's greatest challenges and how are they being met?

Currently SHI is at the stage of relaunching its activities. Lines of orientation have been set providing a framework for future performance over the coming years, aimed at consolidating Sonangol's asset portfolio.

- Promote SHI's sustainability
- Ensure the quality of investments with a view to generating sufficient cash flow to cover its operations and create value for Sonangol E.P.
- Position itself as the main vehicle for Sonangol's international projection abroad

- Adopt company governance rules defined in the code of governance of Sonangol E.P.'s indirect subsidiaries

All this is intended to realise the strategic aim of positioning Sonangol abroad as a player in the area of exploration and production. In light of the expected challenges, strategies have been defined for each of its business units, as well as a range of actions designed for their implementation:

- An integrated organisational model tailored to operations abroad
- Sustainable and economically viable projects which aggregate know-how
- A preference for partnerships with companies with recognised technical capabilities (international oil company operators and service providers) to minimise risk
- Invest in assets with clear potential
- Have a balanced portfolio with a focus on core business
- Governance based on the Sonangol group model

What is the current situation of SHI operations and partnerships in Cuba, Venezuela, the Gulf of Mexico and Brazil?

In Cuba, we are developing geological studies while in Venezuela, SHI has a 20 per cent stake in the company Venangocupet, and two fields (Migas and Melones) are now in the production phase.

In the Gulf of Mexico, we are seeking new opportunities in exploration and/or production.

In Brazil, SHI has a 30 per cent share in the SDM and SOB fields as the operator. Both fields are in the production phase. In partnership with Petrobras, SHI also has a 20 per cent stake in the Guaynabo Block, which is now in its development phase.

Is SHI studying the possibility of operating elsewhere, such as in East Timor?

Taking into account SHI's long-term objective of positioning itself as the main vehicle for projecting Sonangol abroad, some markets have been identified which will be the target of SHI's interest in establishing its presence.

Market selection was based on their potential in terms of oil and gas reserves, the presence of fruitful areas in these regions, as well as the presence of international oil companies with which one may establish partnerships.

SHI's target markets – where we intend to invest, considering preferentially acting as a non-operator and having stakes of not more than 20 per cent – are markets with bilateral state accords: Algeria, East Timor, Vietnam and Indonesia; and new markets such as Latin America and sub-Saharan Africa.

What are SHI's major successes?

The subsidiary's main gains can be summarised as the following:

- The internationalisation of Sonangol
- The ownership of assets in other geographic regions
- The possibility of intensifying prospecting and production in the oil concessions acquired
- Optimising results in the medium and long term.

What other partnerships does SHI have and where?

SHI has a 30 per cent stake in Block 2 in the Special Economic Zone (ZEE). It is also operator in a partnership in São Tomé and Príncipe with Sinoangol STP and ANP-STP. This project is in the exploration phase.

It participated in the fifth round of tenders in Mozambique in partnership with Total for the exploration of hydrocarbons in the Angoche Basin, where it hopes to acquire a 15 per cent stake, if its proposal is successful.

What type of investment is SHI making?

In light of the strategy of renovation underway, SHI has available a portfolio of investments that include exploration projects and field development, in business units where it has a stake. In relation to the

WHERE IN THE WORLD



exploration projects, we concentrate on the acquisition and interpretation of 2D and 3D seismic data, environmental impact studies, and geological and geophysical studies, as well as drilling and research and evaluation well tests (in Brazil, Mozambique and São Tomé and Príncipe).

Other projects being developed include investment in development well drilling and the redevelopment of fields (Brazil and Venezuela). We are also considering investment in acquiring new stakes in assets through 'farm-in' or tenders as part of our new opportunities.

What are your future foreign investment plans?

Regarding future investment, SHI aims to continue existing projects and intensify research in novel exploration and production opportunities in current and new markets, with the objective of developing a sustainable portfolio, in sum:

- Acquire new assets with the potential for oil
- Growth that is based on tenders and acquisitions
- Restructure the portfolio in our current markets
- Broach new markets to research new opportunities

Due to the fall in oil prices, what is the company's current strategy for investment in the short term?

The fall in oil prices has led all of us to be more cautious and creative in everything we do. In our investments we certainly will always have to consider the risk matrix in the first place, so that each dollar invested

brings a return and adds value to the company.

What is your evaluation of the staff currently working at SHI?

Before answering that question directly, I would like to emphasise that there is a corporate plan for training specialist staff in the Sonangol Group, which is co-ordinated by the Corporative Educational Board at Academia Sonangol. The foundations have been laid and steps are being taken to reach the planned objectives. With this in mind, I would say that the staff currently working for SHI is multicultural and multinational given our global activity and brings together the required competencies for the upstream segment. Some of them have more than three decades of experience. The current challenges demand constant updating of knowledge and that's where the corporate plan for training specialists comes in, particularly for those based in Angola.

What is the profile of the workforce?

If we look at the concept of knowledge, skills and attitude, SHI's staff have a profile that demonstrates knowledge and skills. There is work still to be done concerning attitude. As is the case for any organisation in a competitive market, we are concentrating on restoring attitude, and the project 'Vestir a camisola' ('Represent the company with pride') has largely contributed to recovering this value.

We continue to invest in the development of competence and in models of evaluating performance, as

well as in established careers, which will certainly give us a workforce composition with the optimum profile required in the area of activity SHI is seeking and will help us reach the strategic objective mentioned above.

Where do you see SHI in the next two years?

According to SHI's strategic plan over the next two years, we will have a company duly adjusted and resized with a portfolio of restructured assets, and with a new philosophy in broaching new markets, while always taking into account a reduced exposure to risk.

What role should SHI have in Sonangol E.P.?

SHI should position itself as the main vehicle for Sonangol's international projection abroad.

Finally, what would you like your legacy to be as chief executive of the company?

Being a geologist by profession, I would like at the end of my mission at SHI for the company to be recognised and appreciated for having a valuable portfolio of assets, holding a volume of robust reserves capable of contributing to leveraging the objectives of the parent company. Furthermore, I would like to leave the company duly structured and repositioned with its business units from the organisational and operational point of view. **U**

FREDERICO FERRAZ DOMINGOS

Frederico Ferraz Domingos became president of SHI's executive board in April 2015. Born in Negage, Uíge province, in northern Angola in 1962, Domingos has enjoyed a distinguished career in the oil industry. As an 18-year-old he was selected to train in Baku, Azerbaijan, in the former Soviet Union. After five years, he returned to gain practical experience in Angola as an oil geologist, before studying for another five years in Baku. By the 1990s, Domingos was a senior geologist and undertook further studies in Austin (Texas), Lisbon and Luanda.

Domingos moved into management in 1998 as a project co-ordinator where he was involved in oil reservoir characterisation, an area where he has acquired substantial knowledge and computer modelling skills. From 2005 to 2010 he was head of geology at Sonangol's department of exploration. He was named a board member of Sonatide, a shipping services company for the offshore oil industry, in 2005 and was named president of the board of Sonasurf, a provider of offshore vessels and services, in 2010. Domingos was vice chairman of Sonangol P&P from 2012 to 2015.

He speaks Russian, French and English in addition to his native Portuguese.



CHEVRON CARES:

CSR
IN ANGOLA

Mamadou Marcel Blondin Beye from Chevron tells *Universo* about the oil giant's Corporate Social Responsibility experience in Angola

Mali-born Mamadou Marcel Blondin Beye is general manager for policy, government and public affairs for Chevron Africa and Latin America.

He took on his present Houston-based role in January this year but has been with Chevron since 1997. He previously worked in Angola, South Africa and the UK. In Angola, Beye was corporate responsibility manager, where he played a lead role in the design, implementation and evaluation of the award-winning Angola Partnership Initiative. He is also a former chairman of the US-Angola Chamber of Commerce.

Are there any particular characteristics of Angola that make it easier or more difficult to implement CSR projects?

Angola is at the vanguard of social investment for Chevron because we have a long history of productive partnerships with central and provincial governments, Sonangol, multilateral institutions and financial entities that has created an environment that encourages and enables successful social investment.

Beyond contributing through direct business activities and taxes, Chevron has invested more than \$215 million in local Angolan communities over the past 27 years. These strategic social investments focus on health, education and economic development programmes and partnerships.

We have learned through decades of experience that Chevron's business success is built on long-term, collaborative and mutually beneficial relationships. The openness of the Angolan central and provincial governments has been crucial in achieving outstanding results. More importantly, the people of Angola have played a significant role in the success. Communities have always welcomed Chevron and they have also embraced the idea that they must play an active role in their own development.

What measurable progress has been made in the project of reintegrating returning refugees into Angolan society?

Over a decade ago, we agreed to fund reintegration work in several provinces across Angola, including Cuando Cubango. As part of this project, which started in 2005, we constructed and equipped three schools. In addition, we supported income-generating activities at women's empowerment centres established by the United Nations High Commission for Refugees as well as in selected communities. Typical income-generating activities

included cattle breeding, goat breeding, seed multiplication and other agriculture-related endeavours. Our current work in education supports and funds the building of primary, middle, secondary and vocational schools in the provinces of Cabinda, Luanda and Cuando Cubango.

What other kinds of CSR projects are you involved in in Angola?

The investments Chevron makes in the people and communities where it operates are as integral to the company's business success as investments in drilling wells or building production facilities. Chevron's goal is to help develop strong, sustainable local economies with healthy, thriving populations – the foundations of any successful nation and business enterprise.

Chevron works with Sonangol, business partners, the government of Angola and community members to achieve this vision.

We make strategic social investments in three areas: health, education and economic development. In health, Chevron supports programmes that improve mother and infant health care, combat HIV/AIDS, tuberculosis, malaria and other infectious

diseases; and increase the capabilities of healthcare workers, the facilities in which they work and the equipment they uses to perform tests. We support the Cabinda blood bank that provides safe blood transfusions for patients.

We also joined the Ministry of Health and the Baylor College of Medicine International Pediatric AIDS Initiative to help establish the nation's first comprehensive sickle cell screening and treatment programme. The project seeks early diagnosis, better treatment of newborn babies and increased awareness among health professionals. More than 135,000 babies have been tested since July 2011.

Regarding education, Chevron shows its commitment to young Angolans in many ways. In Luanda, we have supported the Instituto Médio Industrial de Luanda (IMIL), a secondary school for more than 3,000 students.

We are partnering with Lwini Foundation and FORMEI in providing vocational training for people with disabilities to improve their access to the job market, and we are also providing a curriculum that aims to develop entrepreneurial skills among young

people, currently implemented in 90 schools. We have contributed to teacher instruction, provided resources for science classes and computer laboratories, and donated a vehicle to transport students to offsite classes.

On the economic development front, one of our most innovative projects is the Cabinda Business Incubator, inaugurated in 2014. Chevron financed the construction of the facility and supplied equipment in the \$500,000 investment. This programme aims to help improve business diversity in the local economy in alignment with the strategic priorities of the Angolan government. A total of 32 companies have benefited from the project.

You have advocated a greater role for business in CSR projects and have mentioned possible roles for commodity companies, presumably in providing seeds and pesticides for farmers. Have these companies shown an interest in co-operating in Angolan projects?

I believe there is important work being done by other corporations in association with central and local governments to create partnerships that develop impactful social

As technology stretches the frontiers of resource development, community expectations are also growing

investment programmes. Many international companies bring jobs, revenue, investments in local suppliers and community programmes to Angola – all the right ingredients for development. But too often, the potential of broader economic and social benefits has not been sustained locally.

As technology stretches the frontiers of resource development, community expectations are also growing. Innovative thinking in our industry has changed so much else, and now it's changing the way we think about community development. Today, that development is being done through multilateral partnerships that include companies, local communities, governments and NGOs. By pooling resources and spending efficiently, we can build larger-scale multi-year initiatives focused on building broad economic capacity.

Why do you think it is so difficult to involve governments in grass-roots social and economic development projects in Africa and Asia, often leaving engagements to international donors? Has there been any change in this attitude in recent years?

Based on our experience in Africa, involving governments as partners has not been difficult, it has been essential. We make a priority to understand the needs of the host countries' communities in order to develop collaborative

Healthcare aid



Lauren Schneider

and sustainable social investment programmes. We understand that we operate today at the centre of a complex ecosystem that includes host governments, business partners, communities, NGOs and multilateral organisations. In this ecosystem, it is important that companies commit themselves to align their business objectives with the particular country's aspirations for economic and human progress.

Chevron has a long history in Angola. What have been its CSR successes in your view, and where and how do you see the company contributing in this area in future?

Over the past three decades, we have spent millions of dollars on health, education and economic development programmes, but I believe it's also important to highlight our local content initiatives.

Chevron’s vision of local content includes building the capacity of the local workforce in order to foster competitiveness and increase the number of local companies supporting the oil and gas industry. The long-term view is to support initiatives aimed at building a robust, capable and competitive chain of locally based companies.

The firm also supports the government’s Angolanisation policy, intended to increase the number of Angolans employed by international companies, particularly in supervisory and management roles, and improve the skills of the national labour force. We partner with local schools and universities, provide scholarships to employees and their children, and provide government employees with access to our facilities for training and development. Approximately 89 per cent of employees and 64 per cent of managers in Chevron in Angola are national workers. We expect to continue boosting the role of Angolan companies in the oil and gas industry and developing national talent for the benefit of the country and Chevron.

What have CSR initiatives contributed directly to Chevron’s Angolan local content and supply chain?

In 2014, Chevron spent more than \$1.5 billion on products and services

supplied by more than 200 Angolan businesses. Approximately 44 per cent of products and services the company purchased by the company were produced locally. Through various programmes, Chevron provides personalised training and professional advice to micro-, small-, and medium-sized Angolan enterprises, helping to increase their competitiveness.

The company also aims to enhance local companies’ understanding of what is needed to effectively compete for business opportunities with large international corporations and enable them to expand by providing sustainable, safe and high-quality goods and services to the Angolan oil and gas industry. To boost the role of homegrown firms in the oil and gas industry, Chevron has sponsored the Business Opportunities for National Companies forum in Luanda for current and potential suppliers.

Most aid donors hope to end food aid and make recipients independent of philanthropy and become self-reliant, turning them into fishermen rather giving them fish. How successful has Chevron been in this regard?

While there will always be a need for donations and traditional corporate philanthropy, the world today demands more deeply collaborative, lasting partnerships between

the private and public sectors to foster prosperity that can last for generations. In Angola, we have had important results achieving this vision. A great example is the Angola Sickle Cell Initiative. The project has not only screened tens of thousands of children, but also trained more than 500 local health professionals on how to perform diagnoses, sample selection and counselling.

While significant progress has been made in the way companies and investors think about social investment, there remains a tendency to define CSR only in terms of philanthropy. Such programmes, however, no longer exist merely to satisfy an obligation. They are proving to be an essential part of bolstering a company’s sustainable worldwide operations. The value of the impact social investments made today can have in five or ten years or even generations from now should never be lost.

What lessons in CSR project implementation have you learned from your experiences in places like the Niger Delta, West Africa and Chad-Cameroon pipelines and South Africa that you can apply to Angola?

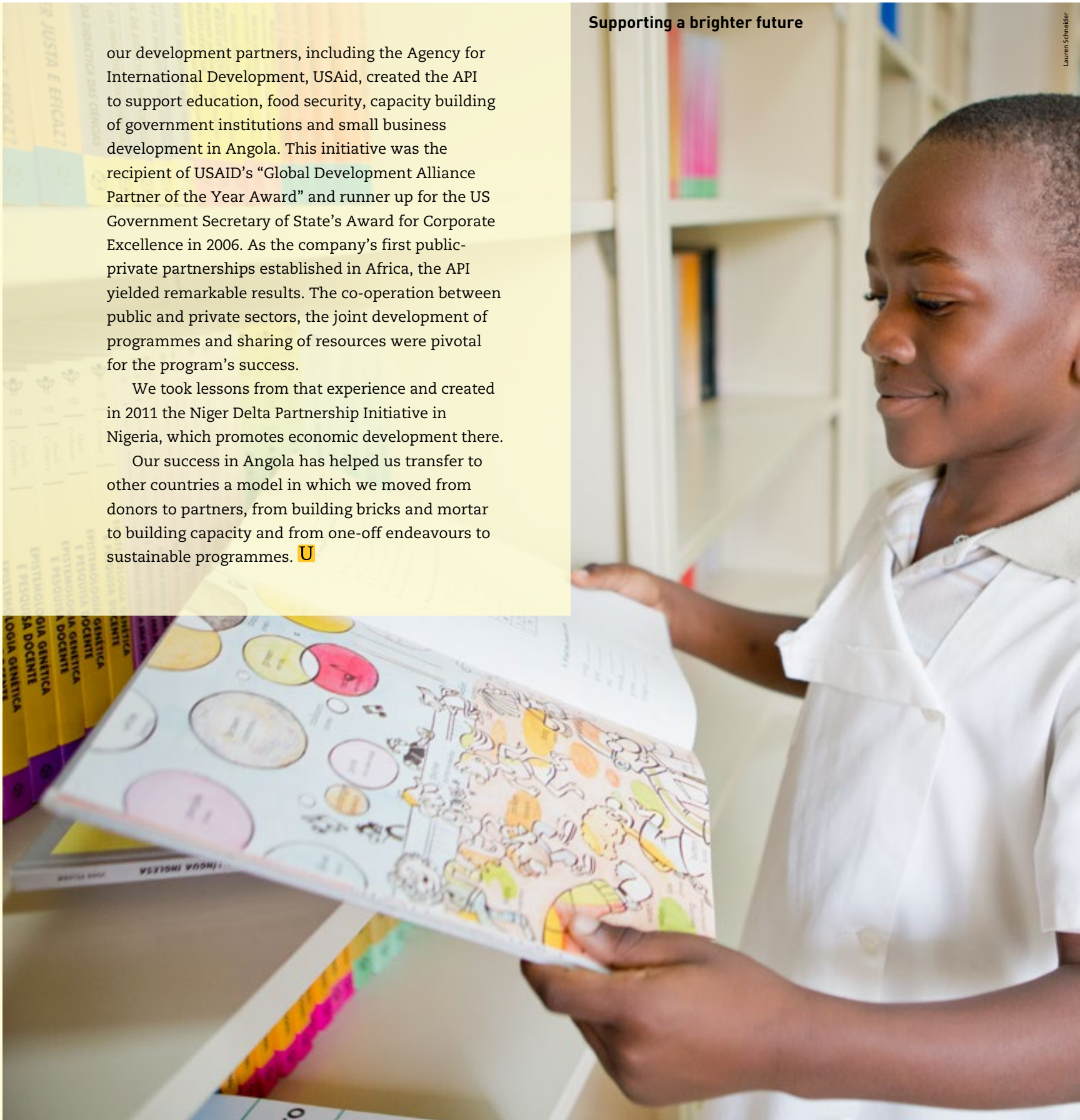
In many ways, it has been the other way around. Social investment initiatives using a public-private partnership approach and participatory development process were first implemented in Angola and have then been replicated in other countries where Chevron has operations. The Angola Partnership Initiative (API), created in 2002, is the perfect example. Chevron and

our development partners, including the Agency for International Development, USAid, created the API to support education, food security, capacity building of government institutions and small business development in Angola. This initiative was the recipient of USAID’s “Global Development Alliance Partner of the Year Award” and runner up for the US Government Secretary of State’s Award for Corporate Excellence in 2006. As the company’s first public-private partnerships established in Africa, the API yielded remarkable results. The co-operation between public and private sectors, the joint development of programmes and sharing of resources were pivotal for the program’s success.

We took lessons from that experience and created in 2011 the Niger Delta Partnership Initiative in Nigeria, which promotes economic development there.

Our success in Angola has helped us transfer to other countries a model in which we moved from donors to partners, from building bricks and mortar to building capacity and from one-off endeavours to sustainable programmes. **U**

Supporting a brighter future



Lauren Schneider

Revitalising ANGOLA'S MATURE FIELDS

It is vital to recover the maximum amount of oil possible from mature wells, as Sonangol engineer and PhD student Geraldo André Raposo Ramos explains

More than 80 per cent of Angola's oil output comes from offshore fields and, according to Halliburton (2012), around 70 per cent of petroleum production comes from mature fields, where recovery of ultimate reserves is often less than 40 per cent.

The recovery factor of most of these fields is declining, and asset integrity management (AIM) is also a major concern, requiring more investment along with cost-effective and low-risk new technologies to enhance production and maintenance of infrastructures from the mature fields. AIM involves keeping hardware, such as oil rigs, in good operating conditions while safeguarding their environment.

However, wells require economic evaluation owing to falling oil prices. They also need environmental studies, field and infrastructure data acquisition as well as the training of qualified specialists in mature field development.

According to Halliburton, mature fields are not defined by their age but rather by where the field is in relation to its peak production. In other words, a mature field is one where oil or gas accumulations have matured to a production plateau or even progressed to a stage of declining production (Abdullah, 2012).

Challenges and opportunities

The major challenges of mature fields are falling production and a need for a cost-effective approach, low-risk technology, and a good understanding and management of reservoirs.

The major opportunities are: the attraction of small- and medium-sized operators, partnerships between

local and major international service companies and the development of local capabilities and cheaper alternatives (Abdullah, 2012).

Also needed is the use of local Angolan content and capacity such as logistical support, engineering and management, fabrication, goods and services, know-how transfer, training and specialisation. There should also be a contractual agreement between shareholders, development of marginal fields and a reduction of the approval cycle, as well as tax incentives.

Major problems

The major issues in Angola mature fields are declining pressure and reserves, high water cut and gas oil ratio (GOR), inadequate gas management, H₂S and sand production, corrosion and degradation of lines, scarce supplies of spare parts, obsolete equipment and old infrastructure. All of these factors lead to unplanned shutdowns.

Revitalisation strategies

Angola's strategies to revitalise mature fields are centred on:

- Potential opportunities with geological and geophysical (G&G) technology
- Enhanced oil recovery (EOR) methods
- Side-tracking, horizontal, multilateral and infill wells
- Upgrading infrastructure (repair, adding on and replacing new equipment)
- Increasing partnership opportunities
- Training Angolan specialist technicians
- Know-how transfer between new and experienced workers

For example, G&G technology plays a role in improving data quality where there is a minimum margin of

01
POTENTIAL
OPPORTUNITIES

02
ENHANCED
OIL RECOVERY

03
MULTILATERAL
WELLS

04
UPGRADING
INFRASTRUCTURE

05
PARTNERSHIP
OPPORTUNITIES

06
TRAINING
SPECIALISTS

07
KNOW-HOW
TRANSFER

error interpretation. New data acquisition will reveal additional information from the field which was unknown at the time of the initial development. This may, among other things, optimise the placement of production and injection wells.

Training and know-how transfer

There is a gap between qualified personnel and the new generation because of the lack of know-how transfer between generations, or between supply and demand (Peek et al., 2008). Other causes of skilled workforce shortage are: lack of educational facilities, lack of vocational and technical training, absence of college academic accreditation and the ever increasing demand for higher-skilled workers. The average age of professionals in oil and gas is one of the highest of any industry, with many people having already retired or about to retire in the next few years. At the same time, student enrolment in petrotechnical and engineering courses has been on the decline for many years, according to Peek et al.

Angola needs to perform a local statistical study identifying qualified and non-qualified personnel from engineers to technicians. After completing this study, Angola needs to make available more systematic short and long professional courses, specialising and training people

in different areas including master’s and PhD programmes. Companies must include coaching and mentoring programmes in order to transfer the know-how to incoming technicians and engineers and thus avoid the gap between the experienced and inexperienced generations.

The country can cut the skilled workforce shortage by increasing education and training. Closer collaboration and coordination is needed among the oil and gas companies. They can expect better results when they act jointly rather than going it alone. Increasing outsourced training opportunities for Angolan professionals in the growing number of educational institutions around the world would be highly beneficial. Finally, oil and gas companies can also provide training within the framework of local content requirements.

Conclusion

In order to stabilise potential capacity and increase oil production, it is advisable to apply more oil recovery techniques to mature fields, even as new fields are coming online. The success of optimising oil recovery processes in mature fields essentially depends on knowledge of the extent of reservoir heterogeneity, identifying the potential areas of bypassed oil and accurate well placement in order to exploit oil. It also requires more specialist personnel to work in mature field development. U

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There is still a lot of oil left underground that cannot be recovered by primary and secondary methods

– Geraldo Ramos

We are now in a period of low oil prices. In the past, what was the general policy regarding mature wells when oil prices were very low? Did companies switch their efforts to ‘lower-hanging fruit’ – that is, wells at the peak of production?

Production from primary and secondary recovery is on average 30 per cent of oil output. So many companies, instead of producing in remote areas like ultra-deep water or areas with very low temperatures, sometimes prefer to invest in existing fields to recover the immobile oil that cannot be recovered using conventional methods. All these depend on oil price and the cost of producing one barrel of oil. Some countries like Saudi Arabia are profitable even with the price of oil being below \$15; however, countries such as the UK, Venezuela, United States and so on, will not be profitable.

With low oil prices, is there any incentive for larger oil companies to lease exploration of mature fields to small- and medium-sized operators? Although many people think that small- and medium-sized companies should be the solution for the mature fields,

this depends on the size of the field and whether the field is offshore or onshore. These companies should be a solution for onshore fields, but I don’t think that they would be capable of maintaining an offshore field or block.

Is there any sign that companies are abandoning mature fields as not worthwhile as oil prices drop? Yes. Even when prices are high, the economic evaluation decides if it is profitable to continue producing or not. Production in relation to the price of a barrel of oil makes investment in a project feasible. For example, Canuco (SNL P&P) and Xikomba (Esso) were fields abandoned in Angola in the past. Oil companies worldwide are more likely to invest in existing mature wells than to invest in more costly, less accessible fields such as those far offshore or in deep water.

Should governments give incentives to mature fields while oil prices are low? Yes, we need incentives – even when the oil price is high. Sometimes it’s cheaper to manufacture parts such as ‘Christmas trees’ [suites of oil and gas valves placed on ocean floors]



overseas than locally due to high taxes and customs.

There is still a lot of oil left underground that cannot be recovered by primary and secondary methods. The average oil produced worldwide is about 30 per cent, and more than 70 per cent of these fields are mature.

Is technology finding innovative ways to exploit mature fields that were previously deemed too difficult? Many techniques and technologies in IOR [improved oil recovery] and EOR [enhanced oil recovery] have been developed in the past few years to recover the immobile oil left in reservoirs including heavy oil. I’m currently working on an EOR project.

Triennial Triumph Angolan Art Comes Home

By Lula Ahrens

The third Luanda Triennial arts festival witnessed the Sindika Dokolo Foundation's landmark success in returning classical Tchokwe art to Angola from Europe

The first edition of the Triennial was launched in 2006. Since then, the cultural mega-event has grown to become a focal point in the increasingly vibrant and artistically dynamic Angolan capital. Titled *From Utopia to Reality*, this year's spectacle aimed to spark debate on the intrinsic value of African art, challenging assumptions that it is both strange and inaccessible.

The latest incarnation of the Luanda Triennial opened on November 1, 2015 and runs until November 30, 2016. It consists of classic and contemporary art exhibitions, theatre projects and publications from Angola's art history,

The theme connecting all the Triennial's elements is the history and future of African art

and some 150 conferences, concerts, radio and television productions, as well as educational programmes for students. The theme connecting all these elements is the history and future of African art.

Not only does the current extravaganza take place in five Angolan cities (Luanda, Huíla, Benguela, Huambo and Zaire), it is also crossing Angola's borders into São Tomé and Príncipe, and even going further afield – Porto, Portugal and Niteroi, Brazil.

The Sindika Dokolo Foundation, which co-runs the Triennial, has its provisional headquarters in the recently restored Iron Palace in Luanda. This remarkable, highly ornamental building in the city centre is believed to have been designed by the world-renowned French engineer Gustave Eiffel famous for the Eiffel Tower in Paris.

A substantial number of Triennial events are being held in the palace and its beautifully lit gardens, among them concerts by legendary bands and singers including Os Kiezos, Carlitos Vieira Dias and Nuno Mingas' Banda Next, as well as Afra Sound Stars, Gabriel Tchiema, Ndaka Yo Wiñi and Anabela Aya.

The exhibition space has been made available by Angolan diamond company Endiama, one of the major sponsors of this year's cultural celebration, has made the exhibition space available.

Luanda's historic Elinga Theatre is also hosting several performances. This traditional venue has reportedly reached an agreement with the Sindika Dokolo Foundation and property development company, Imogestin, as a result of which it will undergo extensive restoration works.

Iron Palace

The Iron Palace (*Palácio de Ferro*) is shrouded in mystery. There are no reliable sources of information about the history of the picturesque building, which is thought to have been erected between 1880 and 1896.

One version of its history claims that a ship carrying the palace's prefabricated cast-iron structure was forced to dock in Angola on its way to an international exhibition. The journey unexpectedly ended in Luanda when the metal structure was bought by a commercial sugar cane company, who put the building together.

When the Angolan civil war broke out in 1975, the palace stood abandoned until a series of state institutions used it as their headquarters. Eventually, the Ministry of Culture handed responsibility for it to Endiama. The state company participated in fully restoring the quaint building, which stands in a green oasis of plants among Luanda's new high-rise buildings in the downtown area. Building work lasted two years and made use of original materials. The palace was reopened to the public in January 2016.



Sindika Dokolo and his wife
Isabel dos Santos



The foundation believes that contemporary African art should be accessible to Africans and have an impact on their lives

Sindika Dokolo Foundation

Art collector and businessman Sindika Dokolo is the son of a Congolese father and Danish mother, and is the husband of President José Eduardo dos Santos' daughter, Isabel. He created the Sindika Dokolo African Collection of Contemporary Art in 2004 with the assistance of its current vice president, Angolan artist and curator Fernando Alvim. Alvim is the moving force behind organising the Triennial, together with other public and private stakeholders.

Dokolo's collection of African art comprises roughly 5,000 works, which include ethnographic art and tribal masks as well as contemporary pieces by William Kentridge, Ghada Amer, Chris Ofili, Marlene Dumas and Yinka Shonibare, among others.

The foundation's credo is that African art should be accessible to Africans and have an impact on their lives. It promotes international marketing of classical art, the development of contemporary art and enhancing the global prestige of African artists.

So far, the institution has held 590 events on African soil. It has also supported educational programmes benefiting 55,000 children. It also played a major role in setting up the first African pavilion at the 52nd Venice Biennale. One of the foundation's goals is to build a contemporary art centre in the Angolan capital.

Return of stolen Angolan art

On February 4, in a symbolic gesture, Sindika Dokolo presented two nearly 200-year-old Tchokwe masks and a statue of a male figure to President dos Santos.

The three pieces had reportedly been looted during Angola's civil war (1975–2002) from the Dundo Museum in the province of Lunda Norte, which had exhibited them during the Portuguese colonial era. The Sindika Dokolo Foundation managed to recover them after years of negotiations with European collectors in France and Belgium.

The timing of the event was symbolic, as February 4, 1961 marked the beginning of the armed struggle

against colonialism and this date is commemorated annually in Angola.

The pieces are to be returned to the same museum in Dundo, after their exhibition at the Triennial.

Back to Africa

Dokolo wants to return to Africa exhibits that originated on the continent. The repatriated artefacts on display are part of a much larger campaign to bring back African works of art currently exhibited in Western institutions or sold on the European and American markets.

The primary target is art appropriated during the colonial era. The foundation's team of researchers and specialists tracks down pieces in personal collections and on the art market. According to the website ArtViatic.com, Dokolo has offered to either buy them for the price originally paid, or possibly sue their owners for theft.

The collector's goal is to return Africa's artistic heritage to Africa and to exhibit the works in the artists' home countries.

He explained his point of view in an interview with *The New York Times* during an exhibition in Portugal: "There are works that disappeared from Africa and are now circulating on the world market based on obvious lies about how they got there." In his opinion the art market's disdain for African art makes this already unacceptable situation even worse.

"Sotheby's and Christie's [the international art auction houses] mostly capitalize on how important African art has been in the modernization of European art, in



terms of its influence on artists like Picasso or Braque," he told the paper.

In another interview with *True Africa*, Dokolo said: "We realised that, although the museum had been completely restored and rehabilitated after the war, none of the masterpieces of African art was there. So, along with my friend Tao Kereffoff, who is an amazing Parisian dealer specialising in classical art, we started working on the archives of Marie-Louise Bastin.

"Bastin was a Belgian lady who passed away in the year 2000. She is

still considered the greatest specialist on Tchokwe art and culture, having spent an incredible amount of time in the Dundo region, doing ethnological work, studying the art, language and music of the Tchokwe people. We realised that her archives contained a lot of pictures of important artworks that were once housed in the museum. These pictures of pieces that were in the museum led us to a logical conclusion. If they were not in the Dundo Museum, then they were probably somewhere on the market."

Behind the Tchokwe masks

The Tchokwe people, once one of the 12 clans of the great Lunda Empire of the 17th and 18th centuries, originate from the northeast of Angola and the southern part of the Democratic Republic of the Congo. They became independent when they refused to continue paying tribute to the Lunda emperor.

A combination of successful trading and abundant resources turned them into one of the wealthiest peoples of Angola. By 1900, the Tchokwe language and influence prevailed in northeastern Angola and spread among the Lunda peoples.

The Portuguese colonial authorities had had very little contact with the tribal group until they began trading wax, rubber and ivory in the 1930s. Soon after this first encounter, the Portuguese brought an end to the regional dominance of the Tchokwe. **U**

The Tchokwe people, once one of the 12 clans of the great Lunda Empire of 17th and 18th-century Angola, originate from the northeast of Angola and southern Democratic Republic of Congo





SONANGOL, 40 YEARS MAKING HISTORY.



Our history began to be written 40 years ago. It's been a journey marked by innovation, training, and of job creation. But also by technological development, discovery of oil fields, internationalisation and commitment to our people in every front. From health to education, from culture to sport, from conservation to environmental sustainability... That's 40 years of history that together we will continue to write, for the well-being of the whole nation.

