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# TANZANIA'S OIL AND GAS CONTRACT REGIME, INVESTMENTS AND MARKETS

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## TABLE OF CONTENTS

### **TANZANIA'S OIL AND GAS CONTRACT REGIME, INVESTMENTS AND MARKETS**

<b>Abstract</b>	<b>2</b>
<b>Introduction</b>	<b>3</b>
<b>Tanzania's petroleum contract regime until 2008</b>	<b>6</b>
<b>On/nearshore exploration licenses in Tanzania 1952–2008</b>	<b>9</b>
Exploration Licenses 1952–1989	9
Exploration and production licenses 1989–2008	10
<b>Tanzania's petroleum contract regime from 2008 until today</b>	<b>17</b>
Exploration and production licenses, onshore, 2008 to date	18
Deep-sea exploration licences, 1999 onwards	20
<b>The expansion of the gas pipeline infrastructure and future exploration prospects</b>	<b>25</b>
The National Natural Gas Infrastructure Project	26
NNGIP and monetisation of natural gas finds	28
<b>The Tanzania LNG Project</b>	<b>31</b>
<b>The East Africa Crude Oil Pipeline</b>	<b>33</b>
<b>Conclusion</b>	<b>34</b>
<b>References</b>	<b>36</b>
<b>Legislation and MPSAs</b>	<b>41</b>
<b>End notes</b>	<b>42</b>

## **ABSTRACT**

This paper analyses the development of Tanzania's petroleum sector based on a review of laws and contracts. It provides an overview of current upstream activities and discusses the potential for the commercialisation of finds through the increasingly important midstream contracts that govern the use of natural gas. It demonstrates that Tanzania has managed to build institutional capacity over the years, but that it struggles to keep abreast of market signals. As a frontier market it experiences a later surge in exploration activities by international oil companies when oil prices are high when compared to more developed markets. Furthermore, its overstretched institutions are also slow at reacting to such changes. The adjustment of its legal and institutional framework therefore often happens too late, potentially undermining the benefits the country could harvest from the sector. Currently, some adjustment may be needed to make it a driving force in the Tanzanian economy.

## INTRODUCTION

Tanzania is the most mature of East Africa's petroleum producers. As the first country in the region to do so, it has been producing gas from on/nearshore finds since 2004. Since 2010 resources have increased exponentially with deep-sea natural gas finds, currently at 47.08 tcf (Ministry of Energy and Minerals, 2016), potentially making the country a significant exporter. In 2015 a US\$ 1.3 billion National Natural Gas Infrastructure Project (NNGIP), a pipeline from Mtwara in the gas-producing southern part of the country to its industrial centre Dar es Salaam, was completed, opening the way for a further expansion of production and of domestic use. The fall in global oil prices in the middle of 2014 led to a slowdown in exploration activity, but a number of projects are still on the horizon. The country has also been at the forefront among east African countries in developing its legal and institutional framework.

The current slowdown in activity is a timely opportunity to take stock of the development of Tanzania's petroleum sector. This paper analyses the development based on a review of laws and contracts – both the Model Production Sharing Agreements (MPSAs), which have guided the negotiation of contracts since their introduction in 1989,<sup>1</sup> and the available evidence on existing contracts.<sup>2</sup> It provides an overview of current upstream activities, highlighting the different challenges brought by junior explorers and international majors, and discusses the potential for the commercialisation of finds through the increasingly important midstream contracts that govern the use of natural gas. The paper demonstrates that the state's confidence vis-à-vis international oil companies heightened significantly with higher oil prices from the late 2000s onwards. This has come under pressure with the falling global oil prices recently, but Tanzania has still managed to reform and strengthen its institutions in ways that will not erode easily.

Rather than promoting an argument of institutional strength or weakness per se, the paper thus shows that the main challenge for a petroleum frontier country like Tanzania is the constant struggle to keep abreast of market signals. Not only does it experience a later surge in exploration activities by international oil companies when oil prices are high when compared to more developed markets; its overstretched institutions are also slow at reacting to such changes. The adjustment of its legal and institutional framework often happens too late, potentially undermining the benefits the country could harvest from the sector. For instance, the Petroleum Act of 2015, which in many ways marks the nadir of the state's reach in the sector, was passed one year after the crash in the international oil prices, having been in preparation for some years.

Though Tanzania may still struggle to get the balance right between maximising the benefits derived from the sector and international market signals, this is in many ways a positive story of how the country has moved from being reliant on donor support for exploration and development activities, to the more confident position taken in the wake of production experience. Though international oil companies had acquired exploration licenses earlier, it was only late in the 2000s, with a hard earned track record as a safe investment destination combined with high global oil prices, and the discovery of offshore deep-sea gas, that the government could increasingly define contracts on its own terms.

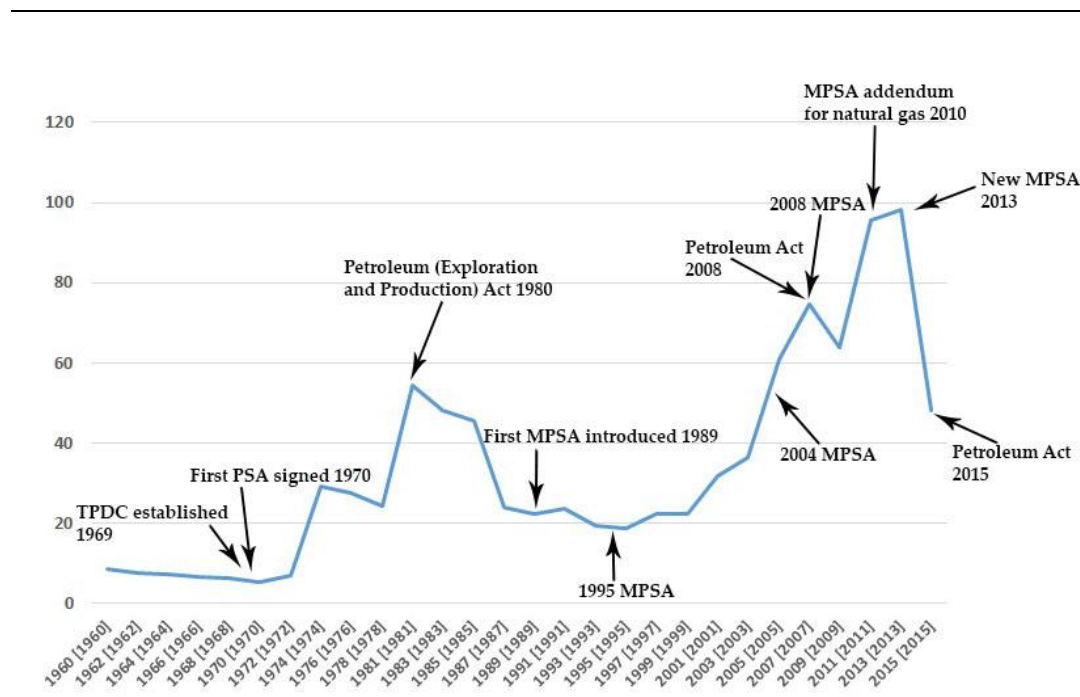
In this respect we identify the time around 2008 as a watershed period in several respects. Firstly, by then the stronger bargaining position of the government had resulted in an increasingly institutionalised contract regime with competitive bidding. Secondly, all nearshore blocks were taken by then and combined with high world market oil prices and recent oil finds in nearby Uganda, this triggered a rush for onshore licences. Thirdly, the Petroleum Act of 2008 strengthened the legal basis for the regulation of midstream and downstream activities, marking an advance in the separation of oversight and commercial functions in the sector. This separation came closer to completion with the Petroleum Act of 2015, which provided the legal basis for the establishment of the Petroleum Upstream Regulatory Authority. Finally, also in 2008, Tanzania began toughening the contract terms significantly with a new Model Production Sharing Agreement (MPSA), both in fiscal terms and in terms of increased state ownership of operations through Tanzania Petroleum Development Company (TPDC).

Following this introduction the paper provides a brief overview of the development of the legal and contractual regime in Tanzania from colonial times until today, focusing on the correlations between market signals and legal and institutional developments. It then proceeds with an overview of the development in the contemporary near and onshore concession contracts up to 2008 and a more in-depth analysis of the Songo Songo and Mnazi Bay projects, which materialised during this period. This is followed by a brief review of onshore exploration and contracting after 2008. The paper goes on to provide an overview of the offshore deep-sea contracts that have been allocated since the first licensing round closed in 2001 until today. The review ends with a consideration of the midstream infrastructure developments, and plans for natural gas use, which illustrates clearly the strengthened role the state sees for itself in the development of the Tanzanian petroleum sector.

A note on terminology: In Tanzania oil companies sign Production Sharing

Agreements (PSAs), which govern relations between companies, state authorities and the state's commercial arm, TPDC. They may also apply for the more specific exploration and production licenses just as they may enter Gas Sales Agreements (GSAs) with the Gas Supply Company (GASCO), a TPDC subsidiary. Throughout the paper we do use these terms when relevant, but we also use 'contracts' as an overall concept that may more easily cover the different types of agreements and licences.

**Figure 1 Average global crude oil prices 1960–2015 and key Tanzanian regulatory events**



## **TANZANIA'S PETROLEUM CONTRACT REGIME UNTIL 2008**

Tanzania's legal framework governing petroleum exploration and extraction has undergone major changes over the years, typically driven by international market developments. However, changes have often come late in the price cycles, which may have impeded the sector's development. In the late colonial period, in 1958, the brief 1922 Mineral Mining Ordinance, was replaced by a new Mining (Mineral Oil) Ordinance, which outlined the terms of petroleum exploration in more detail (T.T., 1922; T.T., 1958; Pedersen and Bofin, 2015). This was most likely a response to the exploration activities by BP and Shell that had started earlier in the decade. BP and Shell's exploration rights were granted under the concessionary system, where exploration and ownership rights were granted to the companies in return for a future royalty to the state (Mgaya 2014).

In 1969 the TPDC was founded by a government order with reference to the Public Corporation Act of the same year, which had empowered the president to establish parastatals by simple decree in order to help develop a domestic petroleum industry and ensure more direct state ownership of shares of operations (URT, 1969; Mukandala 1989. See also Pedersen et al., 2016). This came as a response to the exploration agreement with the Italian oil company AGIP, signed earlier in the same year (Jourdan, 1989; URT, 1980). The one-year old service agreement with AGIP was subsequently turned into a Production Sharing Agreement (PSA) between TPDC and AGIP (Killagane, Undated a). PSAs had come into vogue in developing countries during this period as a way to emphasise national ownership of subsoil resources (Radon 2007) and TPDC has been granted all exploration licenses since then, allowing it to enter joint ventures with foreign partners through such PSAs. AGIP started exploration and in 1973–74 it discovered the gas reserves near the Songo Songo Island, but did not find exploitation viable and relinquished its rights.

The first comprehensive law reform repealing the colonial legal frameworks and institutionalising the PSA contract regime came only in 1980, with the Petroleum (Exploration and Production) Act. By then Tanzania had seen oil prices rise sharply in the wake of the 1973 oil crisis, but had been unable to develop its own known gas resources for several years. The Petroleum (Exploration and Production) Act of 1980 can be seen as an early liberalising reform that aims at providing security for foreign investors after a period of nationalisation in the country under African Socialism. It states that petroleum resources belong to the state, but it allowed the minister, presumably through TPDC, to enter agreements with other oil companies (URT, 1980). The act spurred some exploration activities, but soon prices dropped again.

In 1989, a Model Production Sharing Agreement (MPSA) was introduced to guide the negotiations with private companies (Killagane, Undated a). By then, oil prices were low and almost all exploration companies had left Tanzania. In many ways the 1989 MPSA represents a move towards a more rules-based system that guides, but also limits, the room for negotiation by outlining the royalty and taxation terms. An important innovation is the possibility of arbitration abroad at the International Centre for Settlement of Investment Disputes (ICSID which is part of and funded by the World Bank) in case of conflict (TPDC, 1989). This was a major change from the 1980 Petroleum Act that had left much more discretionary power in the hands of the Commissioner for Petroleum Affairs. The 1989 MPSA has been revised several times. A total of five MPSAs<sup>3</sup> and a model addendum for deep-sea natural gas have been introduced.

Around the turn of the century, development of the Tanzanian gas sector slowly gathered momentum, spurred by a combination of more favourable fiscal terms provided by the 1995 MPSA, the generally more secure investment conditions for foreign investors in the country, and rising oil prices towards the end of the period. Most of the existing agreements, including the offshore contracts, are governed by the 2004 MPSA, and the 2010 Addendum for Natural Gas (discussed in more detail below). It also provided for deep-sea exploration and production, building on a deep-sea survey commissioned by TPDC in 1999 (Killagane undated a; TPDC, 1995 and 2004; PWYP, 2011).

### **Tanzania's Petroleum sector in an East African perspective**

Since Independence Tanzania has been ahead of its East African neighbours in developing the legal and institutional framework required to govern the petroleum sector. Its national oil company, TPDC, was established in 1969, fully 12 years before the National Oil Company of Kenya (NOCK) was set up, in 1981. Tanzania shifted from the use of concessionary and service agreements to PSAs in 1969. This represented both a renegotiation of terms with an exploration company, AGIP, as well as the adoption of what was at the time a very new and progressive framework for resource management (Mgaya, 2014). Tanzania was also the first East African country to repeal colonial era sector legislation, with the Petroleum (Exploration and Production) Act 1980. Kenya did not introduce PSAs until it passed its Petroleum (Exploration and Production) Act 1985.

Uganda's history of exploration started earlier, stretching back to the beginning of the last century, when modest exploration was undertaken in what is now Block 2 on Lake Albert. Poor access and political instability restricted activities in Uganda. New legislation was introduced in 1985, as in Kenya, one year before the National Resistance Movement came to power, suspending negotiations with companies (Patey, 2014 and 2015). The Uganda National Oil Company was not formally established until 2015, and is not yet operational. Its first Chief Executive Officer was appointed in June 2016 (Oil in Uganda, 2016).

## **ON/NEARSHORE EXPLORATION LICENSES IN TANZANIA 1952-2008**

Tanzania has a significant track record of engagement with the international oil industry going back to the late colonial period. This section reviews the contracts with a focus on the on/nearshore exploration licenses awarded in the period 1952 to 2008. Most exploration activities during this period took place along the Indian Ocean rim. During this period Tanzania underwent major shifts in its approach to the international oil companies and this is reflected in the contracts. We first review the evidence up to 1989 based on available literature. 1989 was the year when Tanzania introduced its first MPSA to guide negotiations with oil companies. This is followed by a subsection on the exploration and production licenses from 1989 to 2008. During this period production began and the two major projects, the Songo Songo gas-to-electricity project and the Mnazi Bay gas-to-electricity project are discussed in more detail. Overall, negotiation and regulation were still done from a position of government weakness and with much donor influence.

### **Exploration Licenses 1952-1989**

Between 1952 and 1964 in what is now Tanzania, BP and Shell were awarded coastal exploration rights, including on the islands of Zanzibar, Pemba and Mafia, as concessions.<sup>4</sup> Four wells were drilled in this period showing the presence of oil and gas, but not recoverable commercially (Mgaya, 2014). In 1964 the two firms relinquished their rights, which were transferred to Italian firm AGIP in 1969, but under a revised licence regime: a service agreement where the ownership was transferred to the state (Mgaya 2014; Open Oil, 2013). That same year the state oil company, TPDC was established, in all likelihood as a response to the agreement with AGIP, allowing it to explore for oil (Jourdan, 1989). The license framework was subsequently reformed to accommodate TPDC with the introduction of the country's first PSA. TPDC also took a share in the TIPER oil refinery in Dar es Salaam, which had been established by the Italian oil company ENI in 1966 on the condition that the government could take over a 50% share after a given period of time (ibid; Nyerere, 1965).

Oil prices increased rapidly during the 1970s. Still, Tanzania was not able to develop its own petroleum resources. AGIP had found natural gas at Songo Songo Island in 1974, but at the time, gas production was not commercially viable. Under deep economic distress from a war with Uganda and failed socialist economic policies, the country sought to facilitate renewed exploration activities by the foreign oil companies that had the capital and technical capacity to do so. In 1979, TPDC signed a service contract with

AGIP and Amoco to explore the South Dar es Salaam concession. In 1982 AGIP found gas again, this time in Mnazi Bay at the very south of the country bordering Mozambique, but it was still not able to make production commercially viable. In total AGIP drilled six wells between 1973 and 1982, but with little commercial success (PWYP Tanzania, 2011).

The early 1980s became a busy period for the industry, partly fuelled by the Petroleum (Exploration and Production) Act of 1980, which provided more security for foreign investors after the 1970s emphasis on state control over resources through parastatals. Increasingly, the role of the Tanzanian authorities became one of facilitation. Much of the survey work during this period was undertaken under the auspices of TPDC, funded by the World Bank and Canada. The Commonwealth and Norway were also involved in building legal, administrative and technical capacity (Davison et al. 1988). This was typical of the mixture of private and donor supported activity at the time in Tanzania, which was still regarded very much as a frontier.

Shell was awarded five exploration blocks in 1981, including acreage in the Ruvu Valley (Fee, 2012), where Dodsal Resources made a natural gas discovery last year. Also in 1981, a PSA was signed with International Economic Development Corporation (IEDC) for acreage north of Dar es Salaam. Even Duke University from the US gathered seismic data on Lakes Tanganyika and Malawi through its Project PROBE. Sonatrach, with OPEC funding agreed in 1982 and on behalf of TPDC, also drilled three exploration wells at Kimbiji in Mkuranga district south of Dar es Salaam (Shihata, 2010) one of which struck natural gas in 1982 (Fee, 2012). Other firms issued with concessions in the early 1980s were Elf Aquitaine, Kuwait Foreign Exploration Company, and BHP (PWYP Tanzania, 2011). No further discoveries were made.

### **Exploration and production licenses 1989–2008**

The introduction of Tanzania's first MPSA in 1989 came at a time of low global oil prices. By then most international oil companies had left the country. A round of well development of the Songo Songo gas finds had taken place earlier in the 1980s without commercially viable production ensuing. An attempt to establish a fertiliser factory by US firm Agrico utilising natural gas from Songo Songo also collapsed (Gratwick et al. 2007). The Tanzanian decision makers realised that their regulatory framework needed an update, which resulted in the 1989 MPSA with better terms for private oil companies, including lower TPDC participation and tax waivers. This section provides an overview of the active onshore and nearshore PSAs from the period following.<sup>5</sup>

The 1990s witnessed a gradual return of foreign companies, initially in the form of smaller exploration companies facilitated by donor aid. Around the turn of century some of the big international oil companies also returned, interested in the offshore deep-sea licenses that were offered. Still, the period is characterised by a not fully institutionalised contract regime as some licenses were awarded without competitive bidding. In 1995 Canada's Dublin International Petroleum Ltd signed a PSA for the Mandawa and Rufiji basins. Antrim Resources was issued with licences for Pemba/Zanzibar while fellow Canadian firm Canop Worldwide agreed a PSA for three blocks south of Dar es Salaam, to Mafia (PWYP Tanzania, 2011), both in 1997. Ndovu Resources was issued with the first of a series of licences in 1999 (ibid).

No major new finds were made during the 1990s and political and commercial attention was therefore focused on the developing the Songo Songo and Mnazi Bay resources that had been found in the 1970s and 1980s. Due to Tanzania's status as a petroleum producer and the subsequent greater perceived investment risks, each of these projects required a great deal of innovation in terms of contracts and partnership models. Donor agencies and donor finance were heavily involved, more so in the former project, which was the first of its kind. Because of their distinct characters both projects are analysed in more detail below.

In the 2000s active exploration in nearshore and onshore licence areas has seen other prospects emerging. In 2007 natural gas was discovered in the Mkuranga-1 well, part of the Bigwa-Rufiji-Mafia licence held by Maurel et Prom, a partner in, and operator of, Mnazi Bay (PWYP Tanzania, 2011). The find, just over 50 kms south of Dar es Salaam city centre, may become commercially viable with the construction of the NNGIP, which passes close by to the east, with tie-in valves at Mkuranga ready to receive production if, or when, it comes on-stream. The resource is modest, at 0.2tcf (Muhongo, 2013).

The Kiliwani North development licence is governed by the Nyuni Area PSA. The licence is held by Ndovu Resources, a wholly owned subsidiary of Aminex PLC. Ndovu is the operator with a majority share; the remainder taken up by RAK Gas, Bounty Oil and Solo Oil (Aminex, 2016a). A development licence was issued in 2011 following a discovery at the Kiliwani North-1 in 2008. It is a modest field with proven reserves of 0.027 tcf, located adjacent to the existing Songo Songo field. Kiliwani North development licence came into production in April 2016, supplying NNGIP (see more below), after a Gas Sales agreement with TPDC had been finalised, with production backed by a payment guarantee, likely in the form of an escrow arrangement (Aminex, 2016b).

Aminex/Ndovu are also the principals in the Ruvuma PSA, which saw a natural gas discovery at the Ntorya-1 well in 2012. This has a GIIP of 0.078 and awaits a full appraisal in 2016. A positive appraisal would see it well located to supply NNGIP (Aminex, 2016a).

**Table 1 On/nearshore licences 1989–2008**

<b>Operator</b>	<b>Licence holder</b>	<b>Block/Licence Area</b>	<b>Status</b>
<b>PanAfrican Energy</b>	PanAfrican Energy Tanzania Ltd (wholly owned by Orca Exploration)	Songo Songo development licence	PSA signed 2001
<b>Wentworth Resources</b>	Maurel et Prom	Mnazi Bay development licence	PSA signed 2004
<b>Ndovu Resources</b>	Ndovu Resources (wholly owned by Aminex PLC)	Kiliwani North development licence	Part of Nyuni block, original PSA signed in 2000
<b>Afren</b>	Afren	Tanga Block	Originally signed by Petrodel in 2006, the block is now free following Afren's collapse in 2015
<b>Maurel et Prom</b>	Maurel et Prom	Bigwa Mafia PSA	Signed 2004–5
<b>Ndovu Resources</b>	Ndovu Resources	Ruvuma PSA	Signed 2005

***The Songo Songo gas-to-electricity project***

Songo Songo is the small nearshore island, about 250 kms south of Dar es Salaam, where gas was found in 1974. Steps to commercialise the field were first undertaken in 1991, but it took ten years before the final investment decision was made and it only started producing in 2004, fully 30 years after the discovery. The project is unique in its complexity, but through its important experiences were earned that helped shape later projects and reforms. Initially, approaches were made by Canadian company Ocelot

(later to trade as PanAfrican Energy Tanzania Ltd [PAE]). In 1995 it formed a joint venture for a gas-to-electricity project involving TransCanada Pipelines, with the Tanzania Electricity Supply Company (TANESCO) and TPDC representing the Tanzanian state. This followed in response to the drought-induced power crisis (Gratwick et al. 2007).

Initial financing was mostly concessionary. Early finance was provided by the Swedish development agency (SIDA) related to reforms of the electricity sector. The European Investment Bank (EIB) channelled funds through the Tanzania Development Finance Company Ltd (TDFL). By 1996 the International Finance Corporation (IFC), the German Investment and Development Corporation (DEG), the Dutch development finance agency (FMO) and the Commonwealth Development Corporation were also on board (Gratwick et al. 2007). The mix of development assistance and private and public companies provided for extremely complex financing and management structures. Over twenty contracts had been agreed, even *before* the signing of the final PSA and Power Purchasing Agreement (PPA).

However, the project stalled due to competition from Independent Power Tanzania Limited (IPTL), another independent power producer with which Tanzania entered into agreement during the same period to the consternation of development donors, who chose to delay the Songo Songo project in response (Gratwick, Ghanadan and Eberhard, 2007; Cooksey, 2002).<sup>6</sup> Only in 2001, when a Power Purchase Agreement (PPA) had been finalised, could the project take off. PAE would be controlling the upstream facilities at Songo Songo Island while Songas, a consortium consisting of PAE, CDDC Globeleq and TPDC, would be in charge of the Dar es Salaam power plant and the onshore pipeline and processing infrastructure (Africa Confidential, 2011).

The Tanzanian decision makers were never happy with the limited government control over the project in a sector they see as strategically important. This is part of the reason why relations between the consortium and the Tanzanian authorities have been strained throughout. A nadir was reached in 2011 when the parliamentary Standing Committee for Energy and Minerals undertook an enquiry into the 'levels of participation, efficiency and integrity' of PAE. The inquiry found that PAE had overcharged for costs by charging costs incurred in other countries (Bunge la Tanzania, 2011).

The parliamentary report led to renegotiation of the PSA starting in 2012, focusing on profit-sharing arrangements, TPDC back-in rights, and unbundling of midstream and downstream operations, amongst others (Orca Exploration, 2014). For much of the Songo Songo project's life, it has

furthermore suffered from persistent and significant arrears in payments from TANESCO, a situation that only began to be resolved with an injection of World Bank funds in 2013, though by March 2016 TANESCO still owed Songas US\$ 77.2 million, an increase of c. US\$ 19 million over twelve months (Orca Exploration, 2016).

The PSA has a unique structure, with 'protected gas' being sold to Songas for power production and industrial purposes, and any extra production (dubbed 'additional gas') being subject to a production sharing formula. This formula, surprisingly, gives a rising share of profit gas to PAE as production increases, presumably to compensate for protected gas obligations. The PSA resembles no other agreement entered into in Tanzania, and expires in 2026. In the past two years PAE has produced 80–90 million cubic feet per day (mmcf), below the Songas processing capacity of 102 mmcf, and below the field's productive capacity of 155 mmcf. Negotiations for increasing production and supply to the NNGIP, the gas pipeline from Mtwara to Dar es Salaam that was finished in 2015, are still ongoing (Orca Exploration, 2016).

### ***The Mnazi Bay project***

Mnazi Bay is an onshore/nearshore field on the Msimbati peninsula, approximately 25 km south-east of Mtwara town. Natural gas was first discovered by AGIP/ENI in 1982, at the Mnazi Bay 1 well. Despite the presence of natural gas, the well and the field itself were abandoned by AGIP and they relinquished the licence (RPS, 2015). The concession area is over 700 km<sup>2</sup>, with current production focused around the Msimbati peninsula itself. The development of the Mnazi Bay project began in 2003 when Artumas, now known as Wentworth Resources, proposed a gas-to-power project comprising field development, a gas pipeline and gas processing centre, a gas-fired power plant, and a local power distribution network (RPS, 2015). The project became a much more regular project compared to the Songo Songo project, involving fewer partners and contracts.

The original gas-to-power project was modest, aiming at providing a more stable power supply to the, until then, poorly serviced south-east of the country. An agreement to proceed was reached, expressed in an Agreement of Intent in 2003, and the following year a PSA was signed. It is unclear if the final PSA was based on the Model PSA of 2004 or an earlier one. Very soon the original Mnazi Bay 1 well was re-entered, and three more wells drilled and tested. A development licence was issued in October 2006 covering the whole licence area, divided into nine blocks. The licence is valid until 2031.

Parallel to the field developments, onshore gas processing facilities as well as a pipeline were developed, feeding an 18 MW power plant in Mtwara. Power was first delivered on Christmas Eve 2006 with full field production reaching 2 mmscfd, limited by the capacity of the power plant (RPS, 2015).

Since 2012 the Mnazi Bay concession has been shared between Wentworth Resources and Maurel et Prom, with Maurel et Prom being the operator. Maurel et Prom and Cove Energy bought into the licence in 2009. The following year Artumas changed its name to Wentworth Resources. In 2012 Wentworth and Maurel et Prom bought out Cove Energy. The interest in production operations is set at 48.06% (Maurel et Prom), 31.94% (Wentworth) and 20% (TPDC). TPDC's 20% is a back-in right, which has been taken for existing production, while exploration activities are split 60.075% (Maurel et Prom) and 39.925% (RPS, 2015).

Compared to Songo Songo, the Mnazi Bay concession has been characterised by relatively good relations with TPDC and other state institutions. The Field Reserves Assessment prepared in 2015 suggests that it follows a more regular and simpler agreement structure when compared to the Songo Songo project. The PSA signed in 2004 resembles an orthodox PSA, with a cost recovery level of 60%, which is not unusual, and a sliding profit sharing ratio that favours the state at higher production levels. It differs in that it contains an 'adjustment factor', described as, 'an amount of profit petroleum, the value of which is equal to the amount necessary to fully pay and discharge all liability of the Company for Tanzanian taxes'. A similar, though differently constructed, provision is in place for Songo Songo.<sup>7</sup>

The power contracts through which Mnazi Bay gas is monetised are also considerably simpler than for Songo Songo. Initially, the Mtwara power plant would be fully owned by the production companies, including the pipeline from Mnazi Bay. Part of the funding for this and for the expansion of the electricity grid to reach larger areas was to be provided by the Dutch development bank, FMO. However, after prolonged negotiations TANESCO ended up buying the power plant after having refused to enter a PPA (Gratwick et al. 2007).

A considerable expansion of the Mnazi Bay production capacity began in 2014 following the commissioning of the gas pipeline, NNGIP, to Dar es Salaam. One likely impact of the Songo Songo story has been the oil companies' insistence on there being a payment guarantee for gas supplied to NNGIP. This was put in place in August 2015, though we understand it is not a full guarantee, but an escrow arrangement. With a 25-year development licence signed in 2006, and another gas sales agreement

supplying TPDC with up to 130 mmcfd of gas signed in 2014 to run for 17 years, Mnazi Bay will remain an important part of Tanzania's petroleum scene for years to come (Peng and Poudineh, 2016).<sup>8</sup>

## **TANZANIA'S PETROLEUM CONTRACT REGIME FROM 2008 UNTIL TODAY**

The period around 2008 marks a major change in the Tanzanian contract regime for several reasons. Firstly, because competitive bidding became more institutionalised,<sup>9</sup> and was legislated for in the 2015 Petroleum Act; secondly, because of the consolidation of government institutions, demonstrated in the 2008 Petroleum Act, which strengthened the legal basis for midstream and downstream regulation. This correlates with commercially more viable operations, which are discussed in more detail in the following sections. Another striking characteristic of the period is how the Tanzanian state seeks to maximise benefits accrued from exploration and production, partly through tougher fiscal terms and partly through more direct control and ownership through its commercial entities, TPDC and TANESCO.

With the continued rise in global oil prices and increased interest among oil companies, including some of the oil majors, Tanzania toughened the contract terms significantly from around 2008 onwards. Whereas the Energy Policy back in 2003 had focused on developing the 'limited resources' in order to reduce fuel imports, which, by then, consumed 26% of national export earnings (URT, 2003: 22), the Energy Policy of 2015 changed focus to developing the significant amount of natural gas that has been found, including managing petroleum revenues to promote the 'domestic use of petroleum resource to accelerate socio-economic transformation' (URT, 2015a). The Draft Natural Gas Utilization Master Plan expresses similar objectives (URT, 2016a). The major offshore finds around 2010 contributed significantly to this change, which also reduced the perceived dependence on Western development finance among Tanzanian decision makers. The construction of the US\$ 1.3 billion Mtwara to Dar es Salaam gas pipeline (NNGIP) was financed by a Chinese loan in 2013.

In the 2008 MPSA an Additional Profits Tax was introduced, while the lower deep-sea royalty rate of 5% was removed, with both onshore and offshore charged a royalty of 12.5%. At the same time, headline terms have been tightened, proposing increased state shares in and revenues from operations. The 2008 MPSA also toughened the terms of contracts by providing TPDC with the option to contribute with participating interest of 'not less than 25% of Contract Expenses', much higher than the 5–20% maximum proportion allowed for in the 2004 MPSA (TPDC, 2004; 2008b).

The tougher terms were maintained and even, in some areas, expanded in the 2013 MPSA. The Additional Profits Tax was retained, though the

separate offshore royalty rate was re-introduced, this time at 7.5%. Without full access it is less clear how favourable or unfavourable the 2010 model addendum is. The leaking of the addendum to Statoil's PSA for Block 2, based on the 2010 model addendum, gave only a glimpse of some of these terms and their interpretation are disputed (Pedersen and Bofin, 2015). The 2015 Petroleum Act also marks significantly stronger demands on corporate social responsibility programmes as well as on local content, calling not only for local procurement, but also for significant local ownership of procurement companies (URT, 2015b; Jacob et al., 2016).

This period also sees a clearer separation of regulatory and commercial functions, which had previously been taken care of by TPDC. With the 2008 Petroleum Act, which oversees midstream and downstream activities, the Energy and Water Utilities Regulatory Authority (EWURA) is inscribed in the petroleum laws.<sup>10</sup> The act was probably triggered by the Mtwara gas-to-electricity project, which was implemented by a private consortium. After drawn-out negotiations, the ownership of the power plant in Mtwara ended up in the hands of TANESCO, not the private consortium. This was to mark a new development with increased emphasis on state ownership. Whereas the ownership of the gas pipelines to Mtwara in the initial Mnazi Bay project remained with the private company (a procedure sanctioned by the 2008 Petroleum Act, see URT, 2008), the NNGIP is fully owned by TPDC through its gas trading company, GASCO. The 2015 Petroleum Act, which provides for a complete overhaul of the legal and institutional framework, makes it the duty of the national oil company to own and operate 'major gas infrastructures' (URT, 2015b, section 9).

The 2015 Petroleum Act also established the Petroleum Upstream Regulatory Authority (PURA). It was formulated after a period where Tanzania had witnessed increased interest among international oil companies, and where Tanzanian decision makers clearly felt that they were in the driver's seat. As we shall see below, this was not the case when the oil price collapsed in 2014. The 2015 Act has been evaluated as being weak on disputes since it is not very clear how upstream conflicts involving the government are to be settled. (Maajar and Tibshraeny, 2015). The 2013 model PSA is not much clearer on this, stating that arbitration can be initiated in 'accordance with the International Chamber of Commerce Rules of Conciliation and Arbitration', but carried out in Dar es Salaam and applying Tanzanian law (TPDC, 2013).

### **Exploration and production licenses, onshore, 2008 to date**

Apart from the regulatory changes discussed above, the period from 2008 also witnessed a move to fully onshore exploration, partly because the

nearshore blocks along the Indian Ocean rim had been taken, and partly influenced by the recent finds in Lake Albert in Uganda. However, the end of the period is also marked by a slowdown of exploration activities in onshore/nearshore areas. This has to do with the turn of world market oil prices soon after the signing of most new PSAs (see table above) combined with under-capitalisation of some licence holders. This has been an issue for at least four licences held by: Swala Oil and Gas Tanzania Ltd, Jacka Resources, and Motherland Homes.

**Table 2 Onshore licences 2008–to date**

<b>Operator</b>	<b>Licence holder</b>	<b>Block/Licence area</b>	<b>Date PSA signed</b>	<b>Exploration and/or licence states</b>
<b>Dodsal Hydrocarbons and Power Tanzania Ltd</b>	Dodsal Hydrocarbons and Power Tanzania Ltd	Ruvu Basin	Late 2007	2.17 tcf discovery, July 2015
<b>Beach Petroleum Tanzania Ltd</b>	Beach Petroleum Tanzania Ltd	Lake Tanganyika South	June 2010, 2008 bid round	2D Seismic completed
<b>Heritage Rukwa Tanzania Ltd</b>	Heritage Rukwa Tanzania Ltd	Rukwa Basin	November 2011	2D Seismic completed, one drill prospect identified
<b>Heritage Rukwa Tanzania Ltd</b>	Heritage Rukwa Tanzania Ltd	Kyela Basin	January 2012	2D Seismic completed
<b>Swala Oil and Gas Tanzania Ltd</b>	Swala Oil and Gas Tanzania Ltd	Pangani Basin	February 2012	Licence relinquished in 2016
<b>Swala Oil and Gas Tanzania Ltd</b>	Swala Oil and Gas Tanzania Ltd	Kilosa-Kilombero Basin	February 2012	Seismic completed, one drill prospect identified
<b>Jacka Resources Ltd</b>	Jacka Resources Ltd	Ruhuhu Basin	March 2013	No exploration undertaken, seeking farm-out.
<b>Motherland Homes</b>	Motherland Homes	Malagarasi Basin	January 2012	No data available

The only successful onshore licence awarded in this period has been the Ruvu Basin, held by Dodsal Resources. Just to the east of Dar es Salaam

and far from Rift Valley formations, the firm has an unconfirmed natural gas resource of 2.17 tcf (Guardian, 2016a). Beach Energy has been less successful. It attracted Woodside Energy to farm in to Lake Tanganyika South at 70% in July 2013, only to see their new partners withdraw two years later (Rigzone, 2015). This happened before the oil price collapsed, which has precluded further work on the licence.

Swala's operations in Tanzania are ultimately controlled by Swala Energy of Australia. In April 2016 it announced the suspension of trading on the Australian Stock Exchange (ASX). This was followed in May by an ASX demand for the firm to prove its viability given its precarious cash flow position. It is currently in voluntary administration (Swala Oil and Gas Tanzania, 2016). Its Tanzania entity, Swala Oil and Gas Tanzania Ltd., is also in dispute with one of its joint venture partners, Otto Energy. Swala and its joint venture partners have relinquished one of its licences, Pangani Basin, and are committed to drilling one well in the Kilombero-Kilosa licence area in Morogoro Region, originally planned for 2016, now postponed to 2017 (Menas Associates, 2016a).

Jacka Resources, also of Australia, has been unable to fund basic exploration activities. A 'key strategy' for the company has been 'farming out the capital intensive portions of the work programme' (Jacka Resources, 2015). This has been unsuccessful to date, and the company is seeking to renegotiate its commitments. Heritage Oil has also seen a slowing of activities, with repeated postponements of its first well in Lake Rukwa (Menas Associates 2016b).

Previous efforts to licence Lake Tanganyika North have been unsuccessful. Most recently, talks with RAK Gas following the Fourth Offshore and Lake Tanganyika North ended in RAK Gas withdrawing from negotiations (National Audit Office, 2016). In 2011 Total of France was awarded rights to negotiate, but withdrew in 2013 for reasons unclear.<sup>11</sup> The slow-down in activities means that Tanzanian state authorities have returned to past efforts to facilitate the operations of private companies.

### **Deep-sea exploration licences, 1999 onwards**

Interest in Tanzania peaked after the first deep-sea discovery in 2010. But this was the culmination of ten years of surveying, licencing and exploration. In this section we review the award of licenses, issues related to the investment climate; and point to patterns in the level of state involvement in the sector over those years. We see a pattern of expected interest when prices were rising, building on the TPDC initiative to survey deep-sea blocks in 1999. As we shall see below, this may lead to a

significant Liquefied Natural Gas (LNG) project, but an opportunity to issue more licences in 2013 was missed through a significant tightening of terms just before the oil price crash.

The offshore blocks have generally attracted some of the bigger international oil companies, not least after the gas finds in neighbouring Mozambique in early 2010. Thus BG (later acquired by Shell) farmed in stakes in Ophir's blocks and ExxonMobil farmed in stakes in Statoil's blocks, just before the first major Tanzanian offshore gas finds were made later that year (Corbeau and Ledesma, 2016).

**Table 3 Offshore licencing rounds and awards, 2000–2008**

Licencing type	Dates	Blocks offered	Bids received	Blocks awarded	Licence holders
<b>First Licencing Round</b>	June 2000–April 2001	Blocks 1–6	One, Petrobras	Block 5	Petrobras
<b>Second Licencing Round</b>	3 June 2001–5 July 2002	Blocks 1–4 Blocks 6–12	Two, Shell & Global Resources	Blocks 9–12	Shell
<b>Third Licencing Round</b>	May 2004–May 2005	Blocks 1–4 Blocks 6–8	Unclear	Blocks 1, 2 & 6	Ophir (Block 1) Statoil (Block 2) Petrobras (Block 6)
<b>Direct award</b>	April 2006	Blocks 3 & 4		Blocks 3 & 4	Ophir
<b>Limited tendering</b>	January 2007	Blocks 7 & 8		Blocks 7 & 8	Dominion Petroleum (Block 7) Petrobras (Block 8)
<b>Direct award</b>	May 2008	Mnazi Bay North		Mnazi Bay North	Hydrotanz Ltd.

In 1999 Geophysical Resources of the UK was contracted by TPDC to conduct a deep-sea 2D seismic survey that would cover the area later demarcated as Blocks 1–12 (PWYP Tanzania, 2011). A time of low prices is an auspicious time for states to gather this type of survey data, as demand for survey vessels is low, driving down prices. At the time, the then Minister for Energy and Minerals, the late Abdallah Kigoda, was quoted as saying he had 'very high hopes' that it would lead to considerable investment in the sector. He was not wrong. By then global oil prices were

beginning to rise sharply after hitting a low of US\$ 16 in December 1998. Between 2001 and 2016 Tanzania has demarcated 21 offshore blocks.

However, the success of offshore competitive bidding is disputed. In total there have been four offshore licencing rounds and a limited tender, as outlined in Table 1. Thirty-two blocks have been offered, but only seven fully responsive bids have been received, and just four PSAs have been agreed (National Audit Office, 2016). The direct awards and limited tenders in 2006 and 2007 can be seen as a not very functional licensing system. A performance audit of the offshore licencing rounds conducted by the National Audit Office concluded that TPDC and the Ministry of Energy and Minerals 'did not have the proper system in place to efficiently, effectively and ethically manage the awarding process of contracts and licences for the exploration and development of natural gas' (National Audit Office, 2016).<sup>12</sup>

Indeed, the lack of formal systems for determining when, how and on what terms licencing should take place was an important finding of the audit. One of the less regular awards of exploration licenses during this period is the Mnazi Bay North block, which was 'officially acquired in 2008' (Hydrotanz Ltd, undated). The licence holder, Hydrotanz Ltd., is associated with the controversial PanAfrican Power Ltd (PAP) (Africa Confidential, 2014),<sup>13</sup> incorporated in Tanzania the same year and seemingly with no previous experience in the sector. Public documentation from TPDC does not state what mechanism was used. Available material provided by Hydrotanz and its owners suggests that its main interest is more to sell the license than to develop the field.

Another interesting award in this regard is the direct award of Blocks 3 and 4 to Ophir. At the time, Ophir was represented by a middleman known as Moto Mabanga, variously described as South African or Congolese, though he has self-identified as Tanzanian. Ophir was founded in 2004 with backing from the Mvelaphanda Group of South Africa, founded by the African National Congress's Tokyo Sexwale (Ophir Energy, 2011). BG bought into Blocks 1, 3 and 4 at 60% and became the operator in 2010. Since then three discoveries have been made in Block 4 of 4.5 tcf, which are now the subject of development plans – these resources may therefore be a key cornerstone of Tanzania's potential LNG industry. The licence for Block 3 was relinquished in 2015 due to disappointing exploration results.

**Table 4 Current offshore licencing status, licence holders and reserves**

<b>Operator</b>	<b>Licence holder</b>	<b>Block</b>	<b>Equity holder (%)</b>	<b>Resources (tcf)</b>	<b>Relevant MPSA</b>
BG	BG	Block 1 Block 4	BG (60%) Ophir (20%) Pavilion (20%)	16	2004
Statoil	Statoil	Block 2	Statoil (65%) ExxonMobil (35%)	21	2004
Petrobras		Block 8	Petrobras (100%)		2004
Signet Petroleum	Hydrotanz Ltd.	Mnazi Bay North	Signet Petroleum (80%) Hydrotanz (20%)	–	2008 or 2004 not clear when award made in 2008
TPDC		4/1B and 4/1C	TPDC	–	2013

Fifteen licences have been agreed, negotiations are pending on four, while a decision on whether to enter into negotiations on a further two applications are awaited. The current licencing status is outlined in Table 3 above. It should be noted that in the Second Licencing Round, Shell gained the right to negotiate PSAs for Blocks 9, 10, 11, and 12, but negotiations were never concluded due to objections raised by the Zanzibar authorities.<sup>14</sup> With the acquisition of BG in 2016, Shell has again become more involved. Shell is currently engaged in a dispute with the Tanzanian government over the capital gains tax it should pay for the Tanzanian assets related to the acquisition of BG earlier this year (Kabendera, 2016).

BG announced its first gas discovery in Tanzania in October 2010, causing much excitement in Tanzania. However, questions about the viability of extraction have become pertinent. The find was in Block 4, and the oil price was at US\$ 90. When Statoil announced its first discovery in February 2012 it was over US\$ 110. By the time BG made its most recent discovery in Block 1 in June 2014, it was still over US\$ 100, but on the point of collapse. By the time of the most recent discovery in March 2015, oil had temporarily peaked at US\$ 60, the price at which some observers think that the LNG project, which is required for extraction on this scale, may be viable. Since then, oil has traded below that mark.

The Fourth Offshore and Lake Tanganyika North Licencing Round was much delayed. Originally scheduled to be launched in September 2012, it finally opened in October 2013, and closed on 15 May 2015. A buoyant global oil market – against which gas prices are usually pegged – generated exuberant commentary at the opening. Launching the ill-fated Fourth Offshore Licencing Round, the then Minister Sospeter Muhongo announced that Tanzania was ‘now full throttle ahead to the gas economy.’ (Africa Confidential, 2013).

However, lower prices combined with the introduction of the 2013 MPSA for offshore significantly tightened the fiscal terms on offer and was identified, at least retrospectively, by TPDC officials as contributing to the failure of that round. Another important contributory factor was the geological risk, the blocks being in deeper water than already active deep-sea blocks. The bids received in the period October 2014 to May 2015 were disappointing. For eight blocks, only four bids were received, of which only two were deemed acceptable. Statoil and ExxonMobil’s and Mubadala’s bids were disqualified ‘for being well below the bidding thresholds’. Gazprom withdrew its bid before the round closed. The status of negotiations with RAK GAS is unclear (National Audit Office, 2016). Table 5 lays out the blocks, and the bids received.

**Table 5 Fourth Offshore and Lake Tanganyika North Licencing Round, October 2014 to May 2015**

Block	Bidder(s)	Bids Accepted	Status
Block 4/3A	China National Offshore Oil Corporation (CNOOC) Statoil and ExxonMobil	CNOOC	Bid withdrawn
Block 4/3B	Gazprom	None	-
Block 4/4A Block 4/4B Block 4/5A Block 4/5B	No bids received		
Lake Tanganyika North	RAK Gas	RAK Gas	PSA with Attorney General, according to Ministry of Energy and Minerals

## **THE EXPANSION OF THE GAS PIPELINE INFRASTRUCTURE AND FUTURE EXPLORATION PROSPECTS**

Tanzania's ambition to have the state at the centre of the petroleum industry has been clear since the launch of the National Natural Gas Policy in 2013, and has had its greatest expression in the NNGIP. Possibly the ambition was always there among decision makers in the ruling party, Chama Cha Mapinduzi (CCM) – *the party of the revolution* – which traditionally has seen the state as playing a key role in driving economic development (Lofchie, 2014). However, due to strained finances and reliance on funding from development donors, who preferred private solutions over what they perceived as dysfunctional public institutions, decision makers were not able to pursue it.

Plans for future midstream and downstream projects will test the state's capacity to follow through on the ambition of state ownership and the willingness to balance it with market signals. The LNG project and the East Africa Crude Oil Pipeline (EACOP) in particular will depend on private investments. NNGIP itself will only be economically viable if end industrial and power generation end users can commit to off take. In this section we review the policy framework, the NNGIP, the proposed LNG project, and EACOP. In each we identify tensions between state policy ambitions, and private sector capacity.

The infrastructure development is part of a more direct state involvement in the petroleum sector aiming at maximising Tanzanian benefits from extraction through control of midstream infrastructure, and direction of downstream use. The National Natural Gas Policy of 2013 envisages that the state will '[P]articipate strategically through its National companies (i.e. through PPP) to develop and operate major infrastructure for natural gas' (URT, 2013). This is echoed in the Petroleum Act 2015. The Draft Natural Gas Utilisation Master Plan sets out ambitious targets for domestic use of natural gas for power generation, industry, transport and home use.<sup>15</sup>

Table 6 below gives baseline demand projections for a thirty-year horizon predicated on development of a nationwide natural gas distribution network. The proposals are wide-ranging. Power generation is to be kick-started with a 2.5 times increase in installed generation capacity by 2020. There are, thus, plans to further expand the gas pipeline grid to the rest of the country and, potentially, all neighbouring countries bar Mozambique (URT, 2016a). The draft sets out an ambitious agenda based on an estimate of recoverable reserves of 38.6 tcf, of which 33.3 are envisaged to be used.

**Table 6 Baseline Gas Demand Projection, 2016–2045**

User	DOMESTIC DEMAND							EXPORT DEMAND		TOTAL
	Electricity	Households	Institutions	CNGV	Industries	Petrochemical	Iron & Steel	LNG	Pipe-line	
Demand (tcf)	8.8	0.5	0.1	0.6	3.6	4.3	1.1	11.1	3.1	33.3

### The National Natural Gas Infrastructure Project

This NNGIP from Mtwara to Dar es Salaam is possibly the biggest infrastructure project undertaken by the state. Its completion in 2015 significantly improved the infrastructure linking up the existing on/nearshore fields in the south-western part of Tanzania to its industrial heartland around Dar es Salaam. The NNGIP project has made possible recent increases in production at existing and new fields. There is an emerging framework of Gas Sales Agreements with gas producers delivering to the NNGIP (see following section). The NNGIP project is also intimately linked to the Indian Ocean deep-sea gas finds, linking the potentially record-breaking investments in LNG in the town of Lindi south of Dar es Salaam, with the national grid.

The idea of a natural gas pipeline predates the deep-sea gas finds that began in 2010. Already in the 1990s, TransCanada Pipelines and Ocelot considered a pipeline to Mombasa as one option for commercialising the Songo Songo gas field. In 2006 the East African Community identified the need to ‘Implement the extension of gas pipeline from Dar es Salaam to Tanga, Zanzibar and Mombasa’, presumably the extension of the Songas pipeline (East African Community, 2006). A feasibility study was finally commissioned in 2009 and completed two years later. The feasibility study recommended either the establishment of a Special Purpose Vehicle, jointly owned by Kenya and Tanzania but operating on a commercial basis, or a Public Private Partnership whereby the governments of Kenya and Tanzania would offer a concession on a design, build, finance, operate basis, to a private company (East African Community, 2011).

The discovery of deep-sea natural gas reserves in 2010 heightened the expectations in the country in general, but particularly in Mtwara, the supply base for the deep-sea operations, as well as the site of the modest Mnazi Bay field. In October 2011 a gas-fired power plant was proposed, along with ambitious plans for a transmission line from Mtwara to Singida, tying the south into the national grid. The project was to be financed by

China's Exim Bank (Reuters, 2011). In less than twelve months a funding agreement with Exim Bank was agreed, for funding of what would come to be called the National Natural Gas Infrastructure Project (NNGIP) – a pipeline to evacuate natural gas from Mnazi, Songo Songo and other fields yet to produce, to Dar es Salaam for power generation.

The agreement signed in September 2012 was for US\$ 1,225,000,000, to be repaid over 33 years at 2% per annum. The loan was conditional: prior to finalising the loan agreement contracts were signed with Chinese companies for construction (Aid Data, undated). The lead contract was the China Petroleum Pipeline Bureau (CPPB), a subsidiary of China National Pipeline Corporation (CNPC) a state-owned integrated energy company. TPDC is the contract holder on behalf of the state, with the Australian firm Whorley Parsons contracted to ensure quality control on behalf of TPDC (Engineering News, 2015).

Questions have been raised over the costs of the project. Opposition politicians have alleged that project costs have been grossly inflated, though they have presented no evidence (Kaminyoge, 2014). On technical grounds, NNGIP can be criticised for having too much capacity. Planned capacity is 784 mmcfd, or 1,002 mmcfd if a compressor is used (TPDC, 2015a). Yet total forecast production of onshore/nearshore gas and the domestic market obligation of existing deep-sea reserves only touches 500 mmcfd by 2023 according to BG Tanzania (BG Tanzania, 2014). In the shorter term, if undeveloped finds such as Mkuranga and Ntorya come on-stream, and planned increases in production take place in Songo Songo, Mnazi Bay and Kiliwani North, then feedstock for the gas pipeline will be reach only 297.2 mmcfd.<sup>16</sup> Considerable new gas finds, and the economic capacity to absorb them domestically, would be required for the pipeline to reach capacity.

### **Rising expectations as the petroleum sector develops**

The construction of the pipeline was officially launched on 21 November 2012. Two months later Mtwara witnessed possibly the greatest outbreak of civil unrest since the Majimaji Wars over 100 years before (Mgamba 2013; Taylor 2013). Riots that broke out in January saw at least nine people lose their lives. Roads were blocked, government institutions targeted. The homes of two politicians were also razed. Prior to this, a series of mass demonstrations in December 2012 and January 2013 had been held to protest against the building of the pipeline, under the slogan 'Gesi Haitoki Mtwara' (the gas is not leaving Mtwara), under the leadership of some Mtwara NGOs and local opposition political party branches, as well as religious leaders, both Christian and Muslim. Riots again broke out on 22 May 2013 in a planned action coordinated by SMS to follow the presentation in parliament of the budget for the Ministry of Energy and Minerals. A heavy-handed police response was followed by the deployment of troops in Mtwara town.

### **NNGIP and monetisation of natural gas finds**

The development of a public gas infrastructure has affected the type of contracts that TPDC can sign with companies. Having state-owned infrastructure has allowed for greatly simplified contractual architecture when signing contracts with private oil companies than has been the case in the past for instance and not least when compared with the Songo Songo project. It has already catalysed a significant increase in production. For Mnazi Bay, it has allowed production to rise from 2 mmcf/d to 80 mmcf/d immediately, with the possibility of up to 130 mmcf/d. It has also allowed new production to begin at Kilawani North Development Field (KNDF), releasing 20 mmcf/d, and made production possible at Ntorya and Mkuranga with tie-in valves in place (TPDC, 2015a).

The first GSA to be agreed by TPDC was with Wentworth Resources, though production did not start until one year later, in the final quarter of 2015, due to delays in finalising a payment guarantee. This is required primarily due to long-standing payment arrears problems with the end user, TANESCO. For AMINEX, the GSA was not signed until the guarantee was in place, in January 2016. Not all GSA details are available but the key components have been made public by the companies and can be seen in Table 7.

**Table 7 Gas Sales Agreements Terms**

<b>TERMS</b>	<b>WENTWORTH RESOURCES</b>	<b>AMINEX</b>
<b>PRICE</b>	US\$ 3.00 per mmbtu/US\$ 3.00 per mcf linked to United States Consumer Price Index Industrial Index	US\$ 3.00 per mmbtu/US\$ 3.00 per mcf linked to United States Consumer Price Index Industrial Index
<b>TERM</b>	17 years	Not public
<b>VOLUMES</b>	80 mmcfd for first eight months, up to 130 negotiable	20 mmcfd
<b>PURCHASE POINT</b>	Pipeline connecting existing Mnazi Bay gas production facility to TPDC-owned Madimba Gas Processing Plant	Wellhead
<b>PURCHASE GUARANTEE</b>	'Take or pay' agreement, terms not public.	TPDC obliged to pay monthly in advance; take or pay clause on basis of 85% payment if no delivery taken.
<b>PAYMENT GUARANTEE</b>	In place.	One month guarantee in place, with Tanzania Investment Bank.

Distribution of gas along the NNGIP route for domestic, industrial and power generation use is planned for, with take-off valves at Mtwara, Lindi, Kilwa, Somanga Fungu and Mkuranga (TPDC, 2015a). The government's vision for this is set out in the draft National Natural Gas Master Plan (URT, 2016a). However, implementation of this part of the pipeline project has been slow. The pipeline was finished in 2015 but so far, to our knowledge, no new deals have been struck with potential purchasers of gas. For instance, Dangote Industries, a Nigerian conglomerate, which has set up a cement factory just outside Mtwara town because of its proximity to the gas, has been unable to strike a deal, and has been relying on expensive imported diesel instead until at least the end of 2016 (Lugongo, 2016; Guardian, 2016b). This has shut off a potential market for Mnazi Bay gas, the closest producers, of an estimated 30-40 mmsfd, which would

nearly double sales of Mnazi Bay gas (Wentworth Resources, 2016).

An antipathy to existing independent power producers has also affected Wentworth Resources, and its operator partner, Maurel et Prom. Since June 2016 the natural gas-fired power plant run by US firm Symbion Power has been mothballed. This followed a dispute between Symbion Power and TANESCO over whether or not a fifteen-year power purchase agreement had been entered into, and directly led to a 32% drop in production at Mnazi Bay between the second and third quarters of 2016. (Wentworth, 2016).

Supposedly, the reluctance to enter agreements with customers has to do with internal organisational issues in the Tanzanian government institutions. Regulations and guidelines for the deals TPDC and its pipeline-operating subsidiary GASCO can enter with customers have long been in the making. Combined with a toxic political debate on extractive resources, where the perception that foreign companies get too favourable terms is widespread, this results in an unwillingness to make decisions and strike deals.

## THE TANZANIA LNG PROJECT

The current 37 tcf in deep-sea gas resources can only be monetised through the export of LNG.<sup>17</sup> In this section we discuss the scale of the deep-sea gas resources, across various parameters. These include: scale of the resource; domestic market obligation, and revenues. We use this background to inform a discussion of project feasibility, and likely areas of concern. High exploration and production costs associated with deep-sea drilling, the lack of capacity to absorb such production in Tanzania currently, and the uneconomic price likely to be taken for domestic uses, leave LNG exports as the only feasible option.

Tanzania has insisted on international oil companies cooperating in one joint project in collaboration with TPDC. If it goes ahead, the project will likely be one of the continent's most capital-intensive infrastructure projects ever, with estimated costs of the plant and pipelines alone ranging from US\$ 20–30 billion. This does not include upstream development costs. The two most common scenarios are for a two-train LNG plant consuming 12 tcf over the course of its life, or for an initial two-train plant expanding to four trains, consuming 24 tcf of natural gas (Baunsgaard, 2014). The Draft Natural Gas Utilisation Master Plan's ideal is a two-train LNG plant consuming 11.1 tcf (URT, 2016a). The figures in Table Z below are drawn from an International Monetary Fund exercise to potential revenues using two models based on a 12 tcf plant with two trains, and a 24 tcf plant with four trains.

**Table 8 LNG project: the basic parameters in commercialising 37 tcf**

<b>Natural gas processed over life of project</b>	<b>Annual LNG production (24 years)</b>	<b>Estimated annual revenue to state, for 15 peak production years (US\$)</b>	<b>Estimated Derivative annual domestic market obligation</b>
12 tcf	10 mtpa	3 billion	1.3 tcf
24 tcf	20 mtpa	6 billion	2.6 tcf

However, Tanzania's LNG project emerged at a volatile time in oil and LNG markets and much of the initial optimism surrounding the project has dissipated. Making the project a success depends on a complicated set of factors. The significant fall in oil prices since 2014 has impacted oil-indexed contracts and changes the economics of proposed LNG projects. Oil currently trades below the US\$ 60 that some observers think is required for a commercially viable project. Furthermore, the project itself is beyond TPDC's current capacity to manage, both technically and in terms of scale.

The dynamism in LNG markets in particular creates a complex environment for government and companies in Tanzania to negotiate terms for the LNG project (Corbeau and Ledesma, 2016). It will essentially be governed by two sets of contracts. Upstream, fiscal issues are governed by the PSAs for Blocks 1, 2 and 4, and their addenda for terms specific to natural gas. Though signed and agreed, it would be ignoring experience to expect terms to be completely stable.<sup>18</sup> The LNG project itself will be governed by a Host Government Agreement (HGA). Such agreements are used to define the fiscal and operational framework of large investments, and to protect them against adverse changes in national law, and to define the circumstances in which such changes can be made. Such an agreement would have to be in place before Front End Engineering and Design (FEED) goes ahead.

The PSAs and the HGA cannot be looked at in isolation. The Domestic Market Obligation (DMO), that commits companies to supply a proportion of gas to local markets at lower prices than the LNG product could achieve internationally will have a direct bearing on the economics of the LNG project. Basic fiscal terms in the PSAs (cost recovery limits and profit sharing ratios in particular) are a key component of overall government take from both upstream and midstream operations, as well as of the return the companies can expect. For the HGA, issues to be addressed will include: the nature of TPDC participation; fiscal framework, including tax exemptions; stability of terms; and other relevant government goals, such as local content (Statoil, 2014). Negotiations for the HGA started in late 2016, and are unlikely to be complete by the end of 2017.

## THE EAST AFRICA CRUDE OIL PIPELINE

The decision to construct the East Africa Crude Oil Pipeline from Uganda to the port of Tanga may potentially do the same for the northern and north-western parts of the country. TPDC remains optimistic that oil reserves can be found and developed, particularly in the Western Rift's Lake Tanganyika and Lake Eyasi. This confidence has been key in driving the planned East Africa Crude Oil Pipeline (EACOP) – the proposed export pipeline from Hoima in Uganda would make production and export more feasible.<sup>1</sup> By March 2016 Tanzania's State House was reporting a commitment from Total, the French oil company, to fund the project (URT, 2016). By the following month, the project had been agreed between the two governments. It will be a significant project, costing over US\$ 3.5 billion, approximately 1,443 kms in length, and will pass through Kagera, Shinyanga, Geita, Singida, Manyara and Tanga Regions.

Since then, agreed in September 2016, a Memorandum of Understanding has been signed with the Democratic Republic of Congo (DRC) for joint development of Lake Tanganyika that is based on this premise (URT, 2016b). For the DRC the pipeline is a potential export route from Lake Albert, where exploration is ongoing. The two governments have agreed to share survey data on Lake Tanganyika ([Habari Leo, 2016](#)).

The EACOP will help de-risk prospects in north and north-west Tanzania, by having export infrastructure in place. TPDC has taken further concrete steps to de-risk exploration in the area. An Airborne Gravity Gradiometry Survey was undertaken over Lake Tanganyika North in November 2015 (TPDC, 2015b). This was not the first data from the block. Duke University's Project Probe surveyed the area in the 1970s, while oil seeps had been witnessed as early as 1896 (TPDC, undated). The new survey also covered the Eyasi Wembere Block, an as yet unlicensed block in the north of the country adjacent to Ngorongoro Conservation Area, and Lake Natron (Daily News, 2015).

<sup>1</sup> The decision changed the geometry of East African oil, necessitating the Tullow Oil-led joint venture in Kenya to go it alone with a pipeline from the South Lokichar field in Turkana County to Lamu on the coast.

## CONCLUSION

Tanzania has come a long way in developing its petroleum sector. It is the most mature of the East African countries in terms of projects that have materialised. This has driven reform of its legal and institutional framework. Since 2008 a gradual institutionalisation of competitive bidding has taken place combined with a clearer separation of commercial and regulatory functions. Under the impression of high global oil prices it has furthermore toughened its contract terms significantly in terms of fiscal take, participating interests for the national oil company, TPDC, and local content to such an extent that it may have undermined the latest offshore bid-round, which closed just as global oil prices started going down.

In a historical perspective, it becomes clear that the country has also struggled to keep abreast of commercial developments internationally. In a frontier market with relatively weak state institutions like Tanzania's, it is a constant struggle to respond to market signals. This is aggravated by a marked distrust towards foreign investors in the extractive sectors, which has arguably heightened since the 2015 election. The emphasis on national ownership around 1970, marked by the switch to PSAs and the establishment of TPDC as the state's commercial arm, came just in time for the global price rise later in the decade, but infrastructural constraints – the fact that domestic market was too small to make the extraction of gas viable – combined with widespread nationalisations of the 1970s, which are likely to have scared off potential investors, meant that the country benefitted little. In 1980 it introduced a more investor-friendly legislation only to see it undermined by a drop in oil prices a few years later. Finally, the 2013 MPSA and the Petroleum Act of 2015 seem more designed for the high oil prices before 2015 than the price regime we see today.

Though the petroleum sector is increasingly important, some adjustment is needed to make it a driving force in the Tanzanian economy. After a period of optimistic projection and efforts to maximise Tanzanian benefit from production vis-à-vis the international oil companies, especially through fiscal takes and more active state engagement in the sector, a revision of the terms and conditions under which oil companies operate will probably be needed. In this respect the return to a situation where state authorities spend more time facilitating operations through surveys, etc. is an important step, but a review of the fiscal take set out in the MPSA contract regime could also be required. The prescribed state participation in infrastructure and upstream operations is likely to be softened automatically, simply because it would put too big a strain on state coffers.

However, the tax reductions and renegotiation of contracts that we have

seen elsewhere in the world in the light of lower global oil prices may be a hard sell in a country where the perception that foreign companies access natural resources too cheaply is widespread. Despite a slowdown in the activities of international oil companies there are no signs that terms will be altered anytime soon. This will make Tanzania a less attractive investment destination among international oil companies. The arrears in payments to Songas, the uncertainties related to the operations of Symbion Power and Wentworth Resources, the dispute over tax payments for Shell's takeover of BG, and the dispute over supply of natural gas to Dangote Cement all point to a challenging policy environment. They illustrate that despite the considerable progress that has been made in developing regulatory authorities, they are still open to the political pressures that accompany 'strategic investments'. Though conflicts are not uncommon in the sector, the frequency with which they occur in Tanzania seems quite high. While Tanzania has moved in advance of its neighbours in developing the sector and its regulatory framework, the business environment remains challenging.

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## END NOTES

<sup>1</sup> The paper does not cover Zanzibar, where exploration activities have stalled due to disagreements over sovereignty between the isles' and the Tanzanian Union government. Zanzibar furthermore got its own petroleum act in 2016.

<sup>2</sup> Providing an overview of active licenses combined with some analysis of their content. There is still a great deal of secrecy surrounding gas contracts in Tanzania. Therefore, rather than an exhaustive analysis, the paper aims at using what has become known from the few contracts that have been leaked or made public due to transparency rules in the oil companies' countries of origin to discuss the changing relations between companies and the Tanzanian state.

<sup>3</sup> In 1989, 1995, 2004, 2008 and 2013 respectively.

<sup>4</sup> The period 1952–1964 is used by TPDC in its overview of upstream activity, and covers independence for Tanganyika (1961), and Zanzibar (1963), as well as the establishment of the Union (1964). Presumably these licences were issued before Zanzibar's independence.

<sup>5</sup> The status of licenses fluctuates over time as some are relinquished and others renewed. This paper's overview is based on the table on major oil and gas companies in Tanzania in the latest TEITI report from 2015 (TEITI, 2015: 41), which has been sanctioned by all actors in the sector, supplemented with information from the latest TPDC exploration map from December 2016 (TPDC, 2016).

<sup>6</sup> The IPTL project continues to be controversial. Developed in response to the same drought as the Songo Songo project and following the direct approach made to the government by a Malaysian firm, IPTL was a joint venture between Malaysian firm Mechmar Ltd and VIPEM of Tanzania. The project came on-stream in 2002, amidst allegations of bribery of officials, overpricing, and non-delivery of agreed turbines. The speed with which the IPTL deal was signed off was markedly quicker than for Songas. While the complexity of the Songas project, both technically and financially, will have contributed to that, it has also been alleged that the potential rents available from the IPTL deal, that didn't involve international public sector oversight, also contributed to this (Cooksey, 2002).

<sup>7</sup> The full PSA is not publicly available, but material terms are available in a Reserves Assessment published by Wentworth Resources in 2015 (RPS, 2015).

<sup>8</sup> Initial supplies coming from five existing wells at full production have been being delivered to NNGIP since September 2015, with further wells to be drilled in 2016 (Wentworth, 2015). The 2014 gas sales agreement is a straightforward sale at the inlet to the new TPDC-owned Madimba gas processing facility, part of the NNGIP, while the now minor sales to TANESCO for the Mtwara power plant are governed by a similarly straightforward contract.

<sup>9</sup> In an undated, probably 2004 presentation, the former Managing Director of TPDC describes a policy of 'competitive bidding for deep-sea blocks, and an "open door" approach to onshore' (Killagane, undated a). However, 2008 marks a watershed year as there was both the unorthodox award of an offshore license to Hydrotanz as well as direct awards around then. However, also in 2008, licenses to onshore blocks were awarded to a number of companies from a competitive onshore mini-bid round (TPDC 2008a). Competitive bidding thus became generally more institutionalised from around year 2008.

<sup>10</sup> EWURA had been established already in 2001 as the responsible institution for technical and economic regulation of the electricity, petroleum, natural gas and water sectors in Tanzania (Ghanadan 2009), but only became fully part of the petroleum legislation in 2008.

<sup>11</sup> Disagreement on the production sharing ratios were the stated reason, though an informed source told the authors it was to do with Total wanting ownership of any future pipeline infrastructure, though this cannot be confirmed.

<sup>12</sup> It noted poor communication between the ministry and TPDC, lack of clarity of procedures and unclear allocation of responsibilities. From the NAO report it is also difficult to see how fiscal frameworks have been determined. Finally, it noted that there was no system in place for identifying fraud or corruption (National Audit Office, 2016).

<sup>13</sup> They share the same address. PAP's purchase of the equally controversial independent power producer IPTL in 2013 (see more under the Songo Songo project below) led to the transfer of over US\$ 130 million from an escrow account holding monies that were the subject of a dispute with the electricity utility TANESCO (Policy Forum, 2016).

<sup>14</sup> Shell retains a skeleton presence in Zanzibar and has not relinquished its rights to negotiate.

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<sup>15</sup> The draft NGUMP, published for consultation in October 2016 (Ministry of Energy and Minerals, 2016), has been in development for at least two years.

<sup>16</sup> Authors' calculations, drawing on figures from relevant company's public reports.

<sup>17</sup> To appreciate the real scale of 37 tcf of natural gas resources, we must bear in mind that these are not yet confirmed reserves and that this represents just the gas that is understood to be in the reservoir – the *Gas Initially In Place*. How much of that is a recoverable reserve is yet to be ascertained, and will be determined by how geology, technology, market conditions, fiscal frameworks and political risk are reflected in the economics of the final project.

<sup>18</sup> The experience of the mining sector after the passing of the Mining Act 2010 is a case in point. The Government pushed for, and got, revised terms on gold royalties in particular. As noted above, the terms of the PanAfrican Energy PSA have also been under review.