

Third Party Access to Distribution

Lessons from South Africa

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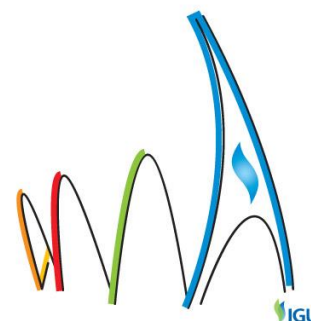
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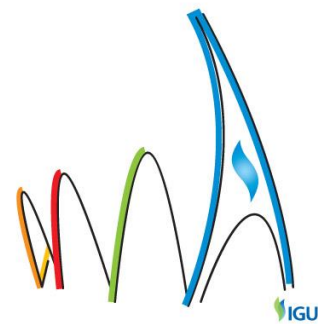
"GROWING TOGETHER TOWARDS A FRIENDLY PLANET"



26th World Gas Conference | 1-5 June 2015 | Paris, France

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Background

Several third party access (TPA) regimes exist in South Africa's energy sub-sectors, each aimed at promoting competition and investment in infrastructure, and enforced by the National Energy Regulator of South Africa (NERSA). In the gas industry, mandatory TPA is required in gas transmission pipelines and storage facilities, whereas access to distribution networks is voluntary. Whilst examples of TPA to gas distribution networks exist, on balance, the uptake of TPA has been disappointing. As different TPA regimes exist in other energy sub-sectors, we examine whether TPA has been more successful in different contexts. It is found that TPA has had disappointing results in all three South African energy sub-sectors under consideration and that the reasons for this are linked to the level of development of the industry in question, the governance arrangements and the lack of diversified sources of supply.

Aims

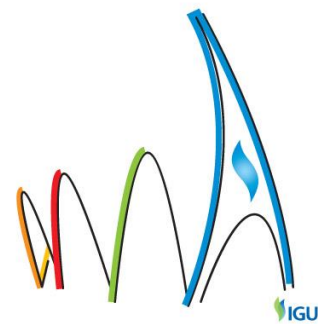
The aims of this paper are as follows:

- Identification and analysis of the factors that have led to the disappointing uptake of TPA in piped gas in South Africa;
- Conduct a comparative analysis of the TPA uptake in two other energy sub-sectors, namely petroleum pipelines and electricity; and
- Formulate remedies and enhanced alternatives to TPA in the development of the gas industry.

Third party access in gas distribution

Gas Distribution defined

The South African definition of distribution differs from those in other jurisdictions. Distribution can refer to pipeline networks that transport gas from the local transmission system to domestic, commercial and industrial gas users at below 7 bar operating pressure (Ofgem definition, UK, Ofgem, 2015). Alternatively, it can refer explicitly to gas transport from the "city gate or plant" to the customer with further refinements of the classification into high pressure, intermediate and lower pressure distribution (USA). The American classification considers operating pressure between 4.14 and 13.79 bar gauge as 'high pressure' distribution, between 0.14 - 4.14 bar as 'intermediate pressure' and below 0.14 bar gauge as 'low pressure' distribution. In the European Union, gas distribution refers exclusively to supply to the end-consumer (or retailing). While the pressure requirements



differ from member to member, it is generally understood that the pressure in distribution pipelines is below 8 bar (COWI, 2011).

The South African definition broadly corresponds to the higher end of the distribution pressure definitions.

Types of Third Party Access

TPA is defined by the European Commission as an obligation on owners of transmission and distribution networks to make the services on their networks available to third parties if there is available capacity. A distinction must be made between regulated and negotiated TPA.

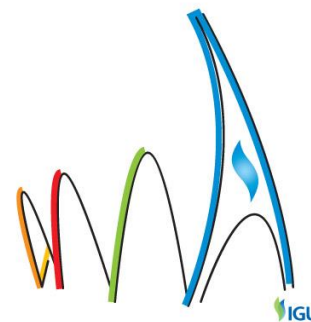
Regulated TPA (rTPA) specifies how the infrastructure use should be defined and how the use rights should be allocated. Typically, the tariff is determined by the regulator under rTPA. Under negotiated TPA (nTPA), the network owner defines terms for negotiation and customers may negotiate commercial access agreements.

Further distinction should be made between TPA, TPA to uncommitted capacity only, common carrier provisions, and open access.

TPA rights denote the following: *"in certain circumstances economically independent undertakings operating in the energy sector should have a legally enforceable right to access and use various energy network facilities owned by other companies"* (Kotlowski, 2007). TPA to uncommitted capacity restricts this right to the network facilities that are not already allocated to contractual obligations (BP Southern Africa (Pty) Ltd, 2013). Common carrier applies when the owner of a network allows competing suppliers of a particular good to transport (or wheel) their product over the network at a tariff and scarce capacity is shared according to certain principles (Changqi & Lui, 2001). Under a common carrier regime, access is provided on a pro-rate basis (Changqi & Lui, 2001). Open access is a TPA rule where the provider of transmission and distribution services has to provide non-discriminatory service to all customers that is comparable to the service that they would provide to themselves at an approved tariff (Gas Strategies Group Ltd, 2015). Unlike common carrier, under open access regimes, access is provided on a first-come-first-served basis (Gas Strategies Group Ltd, 2015).

Third Party Access in South Africa

One of the main objectives of the post-apartheid energy policy (1994 onwards) was expanding access to energy, particularly electricity, to the previously un-served majority of the population. Policy objectives included, *inter alia*, *"(i)ncreasing access to affordable energy services"*; *"(s)timulating economic development"*; promotion of competition and *"(s)ecuring supply through diversity"* (White Paper on Energy Policy, 1998). These objectives



can be served by TPA, particularly the promotion of competition, which can be accelerated by TPA to certain infrastructure, especially in network industries. To implement these objectives, the following Acts were passed:

The 2001 Gas Act

The purpose of the Act is, *inter alia*, to promote orderly development of the piped gas industry and to establish a gas regulator (later incorporated into NERSA) with a regulatory mandate.

The regulator is mandated to impose licence conditions that require the following:

“third parties must in the prescribed manner have access on commercially reasonable terms to uncommitted capacity in transmission pipelines...” and “to uncommitted capacity in storage facilities...” (s21(d) and (f), emphasis added).

NERSA is further mandated to light-handedly approve or regulate tariffs for these facilities:

“...monitor and approve, and if necessary regulate, transmission and storage tariffs and take appropriate action when necessary to ensure that they are applied in a non-discriminatory manner...” (s4(h)).

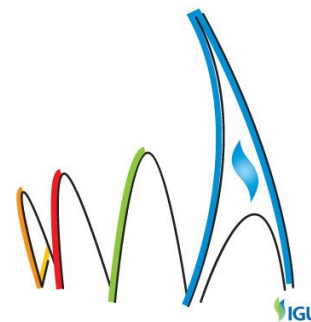
Hence, TPA to gas transmission and storage is mandatory and regulated. However, no such requirement is placed on distribution network operators, and distribution tariffs are wholly unregulated. Therefore the TPA regime applicable to gas facilities has mandatory regulated TPA to transmission pipeline and storage facilities, but a voluntary provision applies to gas distribution networks.

The 2007 Piped-Gas Regulations¹ make provisions for TPA to transmission and storage facilities of piped gas. The elements to be considered when determining uncommitted capacity include the contractual commitments of the licensee, the variations in capacity from line to line, and the load profile. The regulations specify that licensees must develop guidelines for third party use of transmission and storage facilities, these must include the process of obtaining access, the tariff calculation methodology; technical requirements; as well as capacity allocation mechanisms that include provisions regarding:

“(a) use-it-or-lose-it taking into account diurnal and seasonal load profiles;

(b) non-discrimination;

¹ Piped-Gas Regulation, April 2007 (GG No 29792 of 20 April 2007).



(c) defined time periods; and

(d) technical feasibility." (Regulation 6(2)).

In terms of the Rules developed by NERSA,² licensees are required to publish information on uncommitted capacity at their gas facility when directed to do so by the regulator.

Much to the confusion of (potential) entrants to the gas industry, the Act and the incorporated Regulatory Agreement³ provide that distribution companies shall be granted 'an exclusive geographic area.' This provision indicates that distribution networks are considered natural geographic monopolies in which only one company will be allowed to build and operate distribution networks. All licences are valid for 25 years as per the legislation.

On the face of it, this means that distribution operators are able to prevent competition in their distribution areas. However, several mitigating factors have emerged: NERSA has limited these exclusive distribution areas to 200 metres around distribution pipelines; they are limited to a certain specification of gas; and technological innovation such as Compressed Natural Gas (CNG), transportable in modules by road, have provided options for supplying customers by means other than distribution networks. Lastly, as TPA must be provided to transmission pipelines, third parties can supply customers outside licensed distribution areas via transmission tie-ins or their own distribution pipelines. There is also a blanket prohibition against discrimination in terms of access, tariffs, prices, conditions or service unless it is due to an objectively justifiable reason.

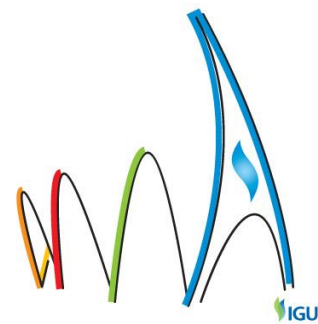
Observations regarding TPA and market structure in South African energy sectors

From the preceding section it is evident that TPA was considered a suitable mechanism for ensuring greater entry and competition in the South African energy sectors. All 3 of these industries were vertically integrated to varying degrees when TPA was introduced and this remains to be the case.

The gas industry in South Africa is characterised by vertical integration, as publicly listed Sasol Ltd is part owner of the gas supplies, majority owner of the only cross-border gas importation pipeline, and sole owner of many transmission pipelines and all of the distribution pipelines. Although different transmission operators exist, two of these own one pipeline each and are geographically separate, and effectively do not compete with each other. Distribution pipelines exist in several of the country's provinces, but are all owned and operated by the same distributor (Sasol Gas, wholly owned subsidiary of Sasol Ltd). The

² Rules in terms of the Gas Act, December 2009 (GG No 32849 of 31 December 2009).

³ The 'Agreement Concerning the Mozambican Gas Pipeline between Sasol Ltd and the Government of South Africa' including Annexure One thereto, the so-called 'Regulatory Agreement', signed September 2001.



paucity of domestic proven gas reserves and lack of alternative gas supplies place strict constraints on the growth of the domestic gas industry.

Although the petroleum storage industry consists of many storage facilities with different owners, these storage facilities are often fully contracted to the major oil companies, with little room for TPA.

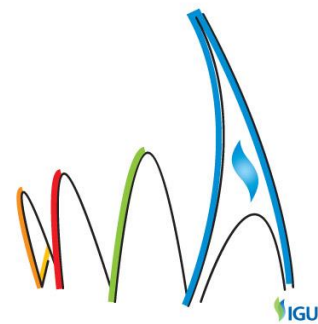
The electricity supply industry is dominated by a state-owned utility, that owns and operates all of the transmission infrastructure, and a significant amount of the generation and distribution infrastructure. Generation capacity is only added as per the country's Integrated Resource Plan and the preferred market structure is one of a Single Buyer.

Introducing TPA under these conditions is particularly challenging as new entrants face barriers to entry such as: the lack of alternative supply of product; scarce uncommitted infrastructure capacity; large upfront capital costs and, particularly in piped gas, downstream competition from the upstream gas supplier.

NERSA implements three different TPA regimes. Two of these, gas transmission and storage on the one hand and petroleum storage on the other, are quite similar. Electricity is quite different, partly because of technological differences (electricity supply is instantaneous); partly because of differences in the market structure (vertically integrated incumbent) and partly because of sectoral governance arrangements (single buyer model).

The market philosophy and structure espoused in the regulatory framework for piped gas and petroleum storage facilities imply a potentially significant role for the private sector in the construction and operation of gas and petroleum storage as well as in gas trading.⁴ Presumably given the stage of development and limited number of market participants in the gas transmission/storage and petroleum storage industries, provision has been made for TPA to uncommitted capacity in the relevant legislation. Importantly, access is restricted to the capacity of the facilities that is not under contractual obligation in piped gas facilities and petroleum storage facilities. In reality, this provision is fraught with interpretation difficulties and potential inefficiencies, as it is not difficult to imagine the possibility of frivolous contractual reservation and other obligations to exclude entry whilst a facility remains effectively underutilised.

⁴ Petroleum products are governed by the Petroleum Products Act (1975).



Results

Disappointing Uptake of TPA

To date, there has been no TPA exercised in the transmission or storage of piped-gas. In gas distribution, a long-standing arrangement between the owner of the distribution network in the Kwazulu Natal province (Sasol Gas) and a gas trader that was partly owned by the same company constitutes the only example of TPA to gas distribution networks to date. Similarly, there have been no successful TPA arrangements in the petroleum storage industry, other than long-standing swapping and hospitality arrangements. NERSA has indicated that no requests for TPA have been made to petroleum facilities and no formal complaints regarding any refusals to provide TPA to petroleum facilities have been received.

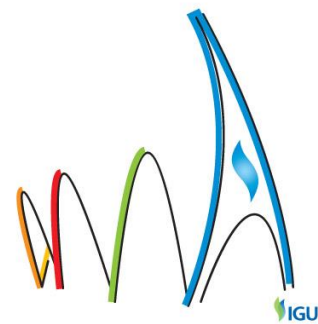
The relatively recent emergence of merchant petroleum storage companies, is likely to highlight differences between TPA to facilities owned and operated by companies that are effectively competitors for the same market and TPA (or common carrier usage) of a merchant facility, whose owner's objective is to maximum throughput of its facilities.

In the electricity industry, there is only one case of a successful TPA agreement. Amatola Power trades in renewable energy that the company wheels (for a tariff) over electricity transmission and distribution networks owned by Eskom and the municipality involved.

This does not mean that there has been no interest in obtaining TPA in the three industries concerned. While there have been no formal complaints from parties who had approached the incumbents for TPA, there have been numerous informal discussions between market players / new entrants and the regulator on the difficulties of obtaining access. These potential entrants have, apparently, approached the incumbents for access and have been either discouraged or turned away for what could be legitimate reasons. This leaves NERSA in a difficult position as in order for it to intervene, there must be a formal complaint.

Factors Hampering the Growth of TPA in the gas industry

The uptake of TPA to gas pipelines and storage has been poor. The disappointing uptake can be attributed to factors other than the expected lack of uncommitted capacity or deliberate attempts to thwart entry by competitors. Instead, the lack of available gas supplies in South Africa and the limited infrastructure to import piped gas, or off-load and re-gasify LNG appear to be the main hurdles. Due to the idiosyncrasies of the regulatory framework, developed to cater for both an existing industry with existing contractual obligations (both commercial and in terms of agreements the South African Government had entered into) and for future developments that were implicitly assumed to follow a similar development trajectory, gas distribution is licensed on an exclusive geographic basis with voluntary third party access.



The lack of mandatory access to distribution infrastructure is undoubtedly a factor hampering the development of the downstream gas industry, as evidenced by several gas traders. In particular the inability to build distribution lines from an existing transmission pipeline or from an existing customer's supply point to another within a licensed distribution area has been cited by at least one entrant in the gas industry.

However, even if this restriction were lifted, other, more fundamental, obstacles would become apparent. At present it is legally possible to obtain access to transmission pipelines to transport piped gas which could, in theory, be imported along the existing import route from Mozambique.

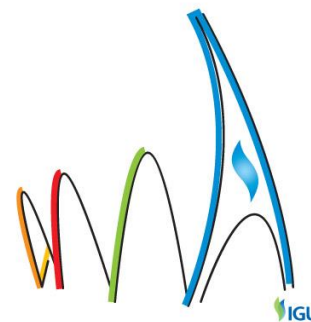
Alternatively, a gas trader could import LNG and supply the gas in liquefied or compressed form via cryogenic or pressurised containers to its customers. Due to the particular prescripts of the Gas Act, there are ways to supply LNG or CNG even within licensed distribution areas.

The more pressing obstacle to all of these scenarios is the lack of alternative gas supplies. Domestic gas reserves are small in South Africa:-

- Domestic natural gas is currently used in a state-owned GTL facility, but these reserves are nearing depletion);
- Domestic shale gas reserves are unproven at present and will take more than a decade to become commercially available; and
- Existing and potential domestic landfill gas and coal bed methane developments are at present unlikely to supply large volumes of gas.

Furthermore import opportunities are limited, despite the proximity to large scale discoveries off the coast of Mozambique. Current supplies of imported piped gas originate from a specific reservoir in Mozambique and the ability of to import significantly larger volumes of Mozambican gas is curtailed by several factors. Firstly, Sasol Ltd is contractually bound to ensure supply to its South African customers for 25 years (from 26 March 2004) and is not allowed to deplete the reserves in question faster unless it proves sufficient reserves are available. Natural gas supply from other Mozambican gas fields, primarily in the Rovuma basin, to South Africa is presently uncertain, given the added distance to the existing cross-border pipeline, and is in any event not immediately available.

What remains is importation of LNG from the global market. In order to access global LNG supplies, significant volumes would need to be purchased and import / off-loading and regasification infrastructure would be required. Although there are plans afoot to develop the



required gas infrastructure in the national Gas Utilisation Master Plan (currently in draft form), such facilities are yet to be financed and constructed.

Hence it is doubtful whether TPA to gas distribution networks will provide a complete solution for new entrants eager to develop downstream gas markets.

Vertical integration

The extent of vertical integration in the gas industry is often seen as an obstacle, although several mitigating factors have been included in the regulatory framework to address the potentially negative impacts on competition and market outcomes, such as:

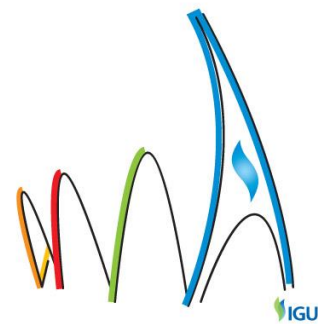
- Account separation (imposed as a licence condition)
- Regulated tariffs (for gas transmission and storage),
- Non-discrimination requirements; and
- NERSA is mandated to approve maximum prices for piped gas (when there is inadequate competition).

Hence vertical integration per se may be seen as an obstacle by new entrants, yet the number of safeguards suggest that vertical integration is not as significant a hurdle to market development than if left unchecked. The problem is clearly more complex, and compounded by the severe lack of differentiated gas supply. It follows therefore, that mandatory vertical unbundling, although beneficial in equitable capacity allocation of the – ever decreasing - natural monopoly aspects of the industry (such as the transmission and distribution networks), is not likely to provide meaningful change.

Proposed remedies and enhanced alternatives to TPA in the development of the gas industry

In order to stimulate competition in the gas market through the growth of TPA, we need to address the factors that are hampering the growth of TPA.

- **Lack of alternative gas supply sources** - TPA requires traders to have access to their own gas, yet if no gas sources are readily available, the question of TPA becomes moot. Alternative gas supply development may require government planning or infrastructure procurement interventions aimed at facilitating gas-to-power options;
- **Inconsistent TPA requirements** - Mandatory TPA is imposed on transmission and storage operators but not to distribution networks, which does not allow a trader to



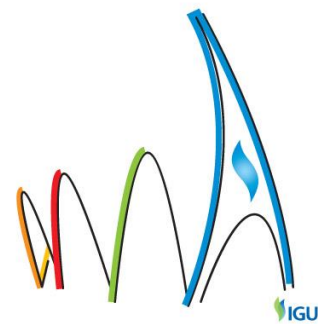
supply any customer within the network. Enhanced mandatory regulated TPA requirements to gas distribution networks may remove some of the barriers to entry. Mandatory TPA to transmission is further limited to 'uncommitted capacity', which in itself, can be unclear and may require establishment of the available capacity by NERSA.

We have observed that it is relatively easy to circumvent the access requirements on uncommitted capacity by merely ensuring capacity is fully contracted irrespective of the actual usage thereof. Therefore, it is worth considering the imposition of a provision that requires that a (small) proportion of capacity remain uncommitted other than in short to medium term contracts, e.g. 1-5 years. If competing demand exists for capacity, transparent and equitable allocation mechanisms must be prescribed. For long term contracts, a 'use-it-or-lose-it' approach can be considered as adopted by the EU in August 2012.

A more far-reaching alternative to TPA would be to move towards a common carrier provision for transmission TPA or to consider vertical unbundling of the transmission network, which is discussed later on in the paper;

- **Outdated provisions of exclusive geographic distribution areas** – Exclusive rights to construct and operate distribution pipelines in a licensed distribution area, rather than the pipelines itself are a barrier for new entrants to connect new customers in existing distribution areas. Moreover, the period for which exclusivity to construct and operate gas distribution pipelines is granted, which is 25 years, may be too long. Our research suggests that pipeline developers and operators would be comfortable with an exclusivity period of approximately 10 years (matching the debt tenor);
- **Technological innovation** – The TPA provisions in the South African regulatory framework relate to storage and transmission facilities and are highly technology specific. New developments such as CNG transported and stored in modules, dubbed 'virtual pipelines' by some, can play an important role in developing the gas market. These and other developments in transportation, liquefaction and regasification were not anticipated at the time of the drafting of the legislation. TPA provisions, and indeed the entire regulatory framework, should ideally be technology-neutral in order to accommodate and incentivise technological change.

Secondly, we need to assess whether TPA is the most suitable vehicle for the pursuit of market development and competition in the gas industry. The arguments against TPA providing a comprehensive solution to the growth of the SA gas market are as follows:

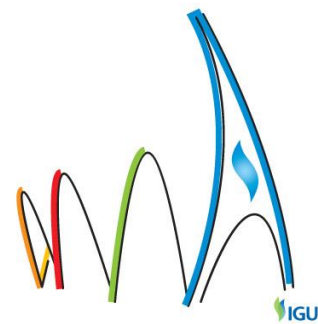


- **TPA requires the existence of infrastructure**, and, where this is yet to be established, TPA appears to be a perceived hurdle to infrastructure investment. South African gas facilities are not as extensive as those in traditional gas countries and have a very low penetration ratio. The lack of existing infrastructure requires an investor friendly regulatory framework. Anecdotal evidence from would be investors indicates that many view TPA as a threat, and some indicate that TPA acts as a disincentive for the large capital outlays needed for the investment in infrastructure (Meintjes, 2015). This may be more of a perceived threat than an actual one in the South African context, yet the more pressing issue of establishing infrastructure as a pre-requisite to developing the gas market remains.
- Another factor that has been identified is the extent of **vertical integration** in the gas industry in South Africa. Whilst, again, this may be more of a perceived threat than an actual one in the context of:
 - o A geographic footprint of gas infrastructure that is limited to a few provinces;
 - o Regulated account unbundling and a prohibition on cross-subsidisation;
 - o Non-discrimination clauses; and
 - o Mandatory TPA to transmission and storage.

It is undoubtedly true that any vertically integrated incumbent is perceived as a threat by new entrants and that vertical integration creates difficulties when alternative business models are introduced. TPA is by definition granted to infrastructure that belongs to other parties and differs markedly from usage of merchant facilities, especially in the commercial approach to customers. This suggests that vertical unbundling would assist in the development of the gas market.

However, it is by no means guaranteed that dramatic changes will ensue following vertical unbundling of existing gas companies. As the lack of diverse gas supplies is a hurdle to entry, access to merchant gas transmission capacity serves no purpose without sufficient gas supply.

In order to address the underlying problem of lack of alternative gas supplies, initiatives aimed at supporting infrastructure development and, in the medium to long term, domestic gas exploration are essential. The Government's initiative of a Gas Utilisation Master Plan is an important step in this regard. Furthermore, continued efforts at ensuring an investment-friendly regulatory environment by NERSA and policy makers, including ensuring greater alignment between various regulatory authorities and harmonisation and simplification of regulatory frameworks, would be beneficial.



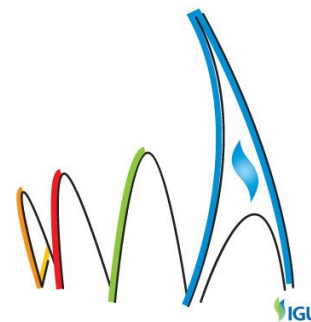
Conclusions

Each of the network industries under the purview of NERSA has experienced difficulty in encouraging TPA for different reasons. Therefore, it is tempting to conclude that regulated TPA cannot work. However, we find that there are more fundamental problems to the development of the energy sectors in South Africa, and the gas market in particular, that are not solved simply by imposing TPA, even in an enhanced form.

TPA provisions will only be taken up in practice if they are appropriately defined; if they address a shortage or hoarding of infrastructure capacity; and if they are adequately enforced. Based on the experience of the South African gas industry, it is imperative to take into account (i) the stage of the development of the industry, particularly of the available infrastructure; (ii) the availability of alternative gas supplies; (iii) the potential for entry and gas-to-gas competition; (iv) the extent of vertical integration; and (v) the overarching regulatory framework. TPA has its limitations, particularly in a developing gas market.

South Africa has neither many gas sources, nor the number of gas customers and has a limited gas pipeline network in comparison to those in Europe. Before it is possible to introduce gas-on-gas competition, it is first necessary to diversify South Africa's gas supply. Growing the demand side of the market is another requirement, and lastly, before TPA to transmission and distribution can be successfully implemented, the pipelines themselves need to be developed in order to connect the multiple suppliers to gas users.

The lessons that other countries can take from the South African experience is that regulation is not a "one size fits all" exercise. The South African regulation of the gas market was largely based on early developments in European regulation, but it has become clear that the South African gas market is very different to the European gas market. The European gas market is more mature than the South African gas market (Department of Minerals and Energy, 2005), with its many sources of gas, many gas consumers and the well-developed intermediate infrastructure transporting gas from the source to the consumer. It is in this context that the TPA regulations have been developed.



References

Bjørnmoose, J., Roca, F., Turgot, T. & Hansen, D. S., 2009. *An Assessment of the Gas and Oil Pipelines in Europe*, IP/A/ITRE/NT/2009-13, Brussels: DIRECTORATE GENERAL FOR INTERNAL POLICIES.

BP Southern Africa (Pty) Ltd. (2013). *Storage Facility Allocation Mechanism*. Retrieved February 11, 2015 from http://www.bp.com/content/dam/bp-country/en_za/Documents/about_BP_South_Africa/Regulatory_Compliance/bpsa_allocation_mechanism_2013_2014.pdf

Changqi, W., & Lui, F. T. (2001, February). *Should Hong Kong Introduce a Gas Common Carrier System?* Retrieved 02 12, 2015 from http://www.bm.ust.hk/~ced/nw_gas3.htm

Commission of European Communities, 1988. *The internal energy market. Commission working document. COM (88) 238 final*, Brussels: European Commission.

Corbeau, A.-S. et al., 2012. *Gas Pricing and Regulation: China's Challenges and IEA Experience*, Paris: International Energy Agency.

COWI, 2011. *Assessing the case for EU legislation on the safety of pipelines and the possible impacts of such initiatives*, Silkeborg: European Commission Directorate-General Environment.

Department of Minerals and Energy, 2005. *Gas Infra-Structure Plan*. s.l.:s.n.

European Commission, 1994. *Directive 94/22/EEC of the European Parliament and of the Council of 30 May 1994*. [Online]

Available at: <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:31994L0022> [Accessed 12 February 2015].

European Commission, 2009. *European Gas Directive 2009/73/EC*. Brussels: s.n.

European Parliament and the European Council. (2009). Regulation (EC) No. 715/2009 on conditions for access to the natural gas transmission networks and repealing Regulation (EC) No. 1775/2005. *Official Journal of the European Union*

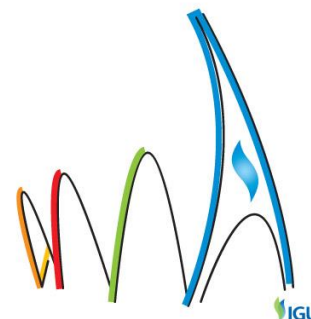
Gas Strategies Group Ltd. (2015). *Gas and LNG Industry Glossary*. Retrieved 02 12, 2015 from <http://www.gasstrategies.com/industry-glossary>

Haase, N., 2008. *European gas market liberalisation: Are regulatory regimes moving towards convergence?*, Oxford: Oxford Institute for Energy Studies.

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Kotlowski, A., 2007. Third-party Access Rights in the Energy Sector: A Competition Law Perspective. *Utilities Law Review*, 16(3), pp. 101-109.

Meintjes, J. P., 2015. *World Gas Conference Interview: Sasol* [Interview] (20 March 2015).

Ofgem, 2015. *Glossary of terms: RIIO-T1 and GD1 review*. [Online]
Available at: <https://www.ofgem.gov.uk/ofgem-publications/48279/glossary.pdf>

Ruble, I. (2015). *EU Energy Security Through Supply Diversification: Do Natural Gas Reserves in the Eastern Mediterranean Present A Viable Option?* London: International Association for Energy Economics.

Yafimava, K., 2013. *The EU Third Package for Gas and the Gas Target Model: Major Contentious Issues Inside and Outside the EU*, Oxford: Oxford Institute for Energy Studies.