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THE TRANS-SAHARAN GAS PIPELINE - AN OVERVIEW OF THE THREATS TO ITS SUCCESS AND THE MEANS TO PREVENT ITS FAILURE

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INTRODUCTION

The Trans-Saharan gas pipeline (TSGP) is a planned natural gas pipeline to transport gas from Nigeria to Algeria and, supply Europe by connecting to the existing Trans-Mediterranean, Maghreb-Europe, Medgaz (expected to be operational in 2010), and Galsi (expected to be operational in 2014) pipelines across the Mediterranean coast.\(^1\) The length of the pipeline would be around 4,300 kilometers (2,671 miles) with about 1,300 kilometers (807 miles) in Nigeria, 750 kilometers (466 miles) in Niger, and 2,220 kilometers (1,367 miles) in Algeria.\(^2\) It will start from the swampy areas of the Niger Delta basin, and then will go through cultivated lands and tropical forest of North Nigeria. In Niger, it will cross the Sahel region, a semi-arid tropical savanna preceding the Sahara desert. Almost half of the route will then roam arid immensities before getting over the Atlas Mountains and finally reaching Hassi R’Mel, a hub for natural gas and oil pipelines running to Algerian coastal cities of Arzew, Algiers, and Skikda.\(^3\) The TSGP has a diameter of 48 to 56 inches (121 to 142 centimeters) and is expected to reach a capacity of 30 billion cubic meters of natural gas, starting by 2015-2017.\(^4\) The cost of the investment is valuated at US$ 13 billion, US$ 10 billion for the pipeline and US$ 3 billion for the gas gathering and Nigerian infrastructure.\(^5\)

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2. *Id.*
4. *Id.*
On July 3, 2009, the Nigeria’s state oil company, Nigerian National Petroleum Corporation announced that Nigeria, Algeria, and Niger signed an agreement to create the TSGP. For the three countries the next stage is to look for commercial partners and, to date, French Total and Italian Eni have expressed interest in joining the project, as well as Russia’s Gazprom and Anglo-Dutch Shell. The Spanish Gas Natural Company is the latest one to have

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7 Id.
declared been working on its participation in the project.\(^9\) With the choice of the members to make up the consortium, goes the search to find the $13 billion required. And inescapably for all the investors, either domestic or foreign, arise the question as to this project is financially viable.

The purpose of this paper is to highlight, consider and discuss the factors that are likely to affect the investor’s decision regarding this particular project. The first and the second part are dedicated to considering and weighing arguments that support this cross-border pipeline or work against it. The third part focuses on the main aspects that should be addressed in structuring the TSGP so as to maximize its chance of success.

I. WHY THIS PROJECT MIGHT WORK

Various reasons, from geological to geopolitical, underpin the European need for the Nigerian gas, and consequently support the feasibility of this cross-border project.

A. Depletion of European Gas Fields

Reserves close to traditional markets, such as Europe, are being depleted, and these markets have to contemplate new, more remote sources of gas to satisfy their needs.\(^\text{10}\) The North Sea used to have substantial gas deposits amounting to some 546 Trillion cubic feet (Tcf), but they are now almost 60% depleted.\(^\text{11}\) The gas situation has been dominated by two major fields, namely the Groningen Field whose extraction started in 1959 in the Netherlands, and the Troll Field in 1979 in Norway, both of which contain the bulk of the region’s endowment of 546 Tcf.\(^\text{12}\) Production reached a peak of 11 Tcf/a in 2004, and is expected to decline gradually in the years ahead.\(^\text{13}\) According to the Nord Stream Consortium (a planned pipeline to link Russia and the European Union via the Baltic Sea), by 2025, as domestic production declines, 81% of the gas the European Union consumes will be imported, compared with 58% in 2005, meaning the continent will have to import nearly 200 billion cubic meters more of gas a year than it does now.\(^\text{14}\)


\(^{12}\) Id. at 199.

\(^{13}\) Id.

B. European Demand Potential for Gas Remains High

Natural gas demand in the European Union will record a steady increase between 1.4 and 2.7% per annum for the next 2-3 decades, according to both the reports of the International Energy Agency (IEA) and the Oxford Institute for Energy Studies (OIES).\(^{15}\)

i. Environmental Concern

Because natural gas produces less carbon dioxide when it is burned than does either coal or petroleum, governments implementing national or regional plans to reduce greenhouse gas emissions may encourage its use to displace other fossil fuels.\(^{16}\) Of the hydrocarbons, gas is relatively environmentally friendly, having high conversion efficiencies from useable to useful energy; burning natural gas emits only 75 percent of the NOx (nitrogen oxides produced during combustion) and 50 percent of the CO\(_2\) released by the burning of other hydrocarbons.\(^{17}\) If the Kyoto Protocol emission targets are to be achieved without the use of more nuclear power, the only realistic option is considerably greater use of gas.\(^{18}\)

ii. Choice Financially Attractive for the Electric Power Sector

Besides a low greenhouse footprint, gas has become the default option for power generation because other advantages such as low capital cost, short lead times (i.e. short payouts), and also because of the lack of construction of new nuclear and coal-fuelled power stations.\(^{19}\) In Europe, more than three-quarters of power demand growth has been met by gas-

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\(^{16}\) Cross-Border Oil and Gas Pipelines: Problems and Prospects, supra note 10, at 7.

\(^{17}\) Id. at 7.

\(^{18}\) Id.

fired power since 2000, and these trends would look set to continue. The preference for combined-cycle gas turbine (CCGT) technology is the result of deregulating and liberalizing electricity to encourage private sector investment.

iii. The Slowdown in the European Nuclear Energy

While many models, such as the IEA’s and the OIES’s, have projected Europe’s gas-import needs will rise steeply over the long term, others, point out that renewable energy, which pursuant to the European action plan for Energy Efficiency for the 2020 goal, must supply 20% of electricity by 2020 (20-20-20 programme), compared with 8.5% now, will steal market share from gas and other hydrocarbons. This goal seems to be narrowly linked to the development of nuclear energy though, for which in Europe a wide divergence of approaches remains. And if the 20-20-20 programme and the Kyoto Protocol emission targets are to be achieved without the use of more nuclear power, the only realistic option is considerably greater use of gas. The absence of position of the European Commission combined with the lingering disagreement among the member countries seems to be another factor refuting a long-term drop in demand for gas. Nevertheless, any progress toward a European consensus in favor of the growth of the nuclear energy could undermine the TSGP profitability.

20 Id.
21 Cross-Border Oil and Gas Pipelines: Problems and Prospects, supra note 10, at 7.
C. Uncertainty over the Feasibility of Shale-Gas Production in Europe

As shale-gas (natural gas produced from shale) is a booming source in the United States, companies are now looking for shale gas in Europe.\textsuperscript{25} At first sight, this factor could weigh against the need of the TSGP gas. However, different reasons show that shale-gas could not be a threat to the TSGP project. European basins are far smaller than the basins in North America, and more geologically complex.\textsuperscript{26} Among the impediments to a similar boom in Europe, there are the depth of the deposits (the deeper the gas deposits, the higher market price of gas would need to be to make recovery economically feasible), issues around regulations, lack of supply chain, lack of appropriate rigs and equipment, conflicts with surface owners over developments in heavily populated Europe, and concerns over the environmental impact of industrial development.\textsuperscript{27} In other words, costs for exploration and production are estimated to be much higher in Europe than in the United States and, because of the uncertainty around the project’s return, this new gas supply might then not grow in Europe as it is in the United States. So far, Europe’s shale-gas appears to offer a meaningful but small target.\textsuperscript{28}

D. The Credibility of Reaching an Off-Take Contract

“We’re not going to build this pipeline without long-term contracts”, said the Algerian energy Minister Chakib Khelil.\textsuperscript{29} This statement appears to refer to the project finance technique

\textsuperscript{26} Id.
\textsuperscript{28} \textit{Europe Needs Home-Grown Gas}, supra note 25.
that will likely be used to develop the TSGP. This technique requires a long-term contract, which in turn requires that a demand for such production of gas is met. Given the cost of the project, this model will permit the sponsors (private and state-owned companies) to spread risks over the participants, including the lenders, and not having to resort to internal cash generation (the amount of which for this project will be so important that it will impair the participants ability to be involved in other projects). Although large scale projects in developing countries such as the TSGP can be financed through public finances, this approach engenders significant potential exposure for the public finances as the concerned countries will bear most of the risks associated with their participation. By placing this heavy burden on public resources, they often deteriorate fiscal conditions. To limit public expenditures and its negative consequences (tax increase, lack of funds for other projects), the mechanism of project finance – which substitutes private investment for public expenditures – is considered an appropriate mechanism. As a result, gas pipelines are typically financed through a combination of sponsor equity and project financing, and as to the TSGP is concerned, Nigeria, Niger, and Algeria plan to finance 75 per cent of the cost of the project with borrowed funds.

For such financing technique to be available, the project is required to produce a predictable cash flow. This revenue is materialized in the off-take contract, considered as the ‘linchpin’ of the project. The revenues generated by this long-term sales agreement between the

32 Id.
33 Id.
35 HOFFMANN, supra note 30, at 14.
producer and the consumer service the debt that will permit the financing of the project. This contract will be the foundation for lending the requisite funds, making possible for the parties to construct and maintain the infrastructure – in particular the pipeline – necessary to support natural gas trade.  

Even if the use of short-term contracts and spot sales are rising, the use of long-term purchase agreements in the gas market should not go away in the foreseeable future. What the Algerian minister meant is that, without these long-term contracts, no producers (and bankers who support producers) will be willing to shoulder the risks associated with multi-billion dollar investments. But more than the contract itself, it is the terms that are crucial. The success of this kind of agreement depends on the parties’ ability to match appropriate contractual terms with the specific circumstances of the producer’s upstream development and the purchaser’s downstream consumption.

Several concerns need be addressed by the off-take contract, the first of them being the commitment to the seller of a sufficient quantity of the production, and not to sell gas to another market/purchaser. Price adjustment is also subject to close scrutiny since gas being a commodity, the parties will want to make sure that prices always stick to the value of the product during the entire life of the off-take contract. Two other essential features of a long-term

40 Lowe, *supra* note 36.
41 *Id.*
contract involved in a pipeline project are ‘take-or-pay’ and ‘ship-or-pay’ clauses.\footnote{Stein, supra note 34, at 282.} The ‘take-or-pay’ provision determines the amount of gas (usually 80% of the quantity agreed upon in the contract) that the purchaser must either take and pay for, or if it does not take, must pay for anyway.\footnote{Gaille, supra note 39, at 658.} This provision is sometimes referred to as a “hell-or-high water” obligation\footnote{Hoffmann, supra note 30, at 210.} and, in project finance, is used as an indirect guarantee, i.e. that revenues under the off-take contract will be sufficient for debt service payments.\footnote{Id. at 250.} In the case of a pipeline project, the ship-or-pay provision refers to the commitment to the pipeline company by the user (which is the producer or the purchaser\footnote{See infra part III D.} to pay transport tariffs even if the user is not in a position to supply or purchase the gas for transport.\footnote{Stein, supra note 34, at 282.} From the purchaser standpoint, one important feature is the deliver-or-pay clause that will protect its interest in receiving the gas it has contracted to buy; in this arrangement the producer agrees to pass a definite amount of gas through a pipeline, or if it defaults, to pay a penalty to the purchaser.\footnote{Esteban C. Buljevich, Yoon S. Park, Project Financing and the International Financial Markets, 190 (Kluwer Academic Publishers 1999).}

Nevertheless, even if a constant demand is established and European purchasers are willing to reach a long-term sales agreement, it will be challenging to find an agreement for such duration when it comes to the energy market. Indeed, it is hard to predict energy prices for one year ahead, so it is obviously much harder for 15 to 20 years, in particular with the current context of financial crisis that made the price of gas dramatically decrease.\footnote{See infra part II B.} The sales agreement has thus to show some flexibility as to the determination of the price. But in the meantime, for

\fnotes\begin{footnotes}{1}{Stein, supra note 34, at 282.\vphantom{282.}}
\footnotes{2}{Gaille, supra note 39, at 658.}\footnotes{3}{Hoffmann, supra note 30, at 210.}\footnotes{4}{Id. at 250.}\footnotes{5}{See infra part III D.}\footnotes{6}{Stein, supra note 34, at 282.}\footnotes{7}{Esteban C. Buljevich, Yoon S. Park, Project Financing and the International Financial Markets, 190 (Kluwer Academic Publishers 1999).}\footnotes{8}{See infra part II B.}
the sake of the project viability, the contract must be rigid enough to be worth signing.\(^{50}\) Gas pricing (e.g. re-opener clause, oil indexation clause) appears to be one of the critical aspects in structuring the TSGP project.

E. The Preference for a Pipeline over LNG Technology: Factors that Underpin this Preference

Even with a sufficient demand for gas in Europe, the question remains whether a pipeline is the best means to transport the output. Why not using the liquefied natural gas technology (LNG) instead? This consists in cooling the gas to liquefy it and shrink it to 1/600 of its original volume, which permits handling and transportation.\(^{51}\) LNG is then shipped in cryogenic tankers to terminals in the importing countries, where it is re-gasified, by reducing the pressure so that the liquid warms and is fed into local pipelines.\(^{52}\) Despite recent improvements, LNG is considered cost-competitive with pipelines only over a distance greater than 3,000 miles (4,800 kilometers).\(^{53}\) According to this criterion, the 2,671 miles of the TSGP makes then the TSGP more competitive than LNG. If the pipelines connecting Algeria and Europe did not already exist, the opposite conclusion would be drawn.

The disadvantages of LNG include the fact that 15-18\% of gas is wasted during the process of liquefaction.\(^{54}\) Also, the lead time for LNG projects (six to ten years), is longer than in pipeline projects.\(^{55}\) Moreover, LNG raises critical safety concerns since it represents highly concentrated energy even if the record with respect to this matter is so far excellent.\(^{56}\) LNG shipping can indeed pride itself on no accident having caused adverse affects to the

\(^{50}\) *Cross-Border Oil and Gas Pipelines: Problems and Prospects, supra* note 10, at 6.

\(^{51}\) Lowe, *supra* note 36.

\(^{52}\) *Id.*

\(^{53}\) *Cross-Border Oil and Gas Pipelines: Problems and Prospects, supra* note 10, at 3.

\(^{54}\) *Id.* at 6-7.

\(^{55}\) *Id.* at 7; *see also* Lowe *supra* note 36.

\(^{56}\) Lowe, *supra* note 36.
environment but LNG import terminals, because of this concentrated energy, are often subject to virulent protests. The widespread fear is that LNG ships and terminals can be targets of terrorist attacks since, during the time gas is stored in confined spaces before liquefaction, gas is explosive. But this terrorist threat exists also for a gas pipeline, in particular a pipeline such as the TSGP. Another criticism associated with LNG is limited interchangeability, meaning that the gas stream available for exportation may not be compatible with the market to which it plans to go. The problem is more acute for LNG than for pipelines and if eventually this interchangeability issue is manageable, it also bears an extra cost. With respect to local benefits, both the TSGP and the LNG option will contribute to eliminate natural gas flaring in Nigeria. But the TSGP is alleged to have over the LGN option the critical advantage of also supply gas to Northern Nigeria, Niger, Southern Algeria as well as Burkina Faso and Southern Mali (by becoming the first segment of a regional grid), countries and regions which are currently devastatingly affected by high energy prices and desertification.

F. Sufficient Nigerian Reserves

“Nigeria has the 7th largest gas reserves in the world. The gas quality is high – [being] particularly rich in liquids and low in sulphur. To date, [although] Nigeria has never explored for gas, [the] scope for huge growth exists.” The proven abundant gas reserves still untapped in Nigeria are a key argument to hail the merits of the project. They are estimated at 184 billion

57 Id.
58 Id.; Professor John S. Lowe provides the example of the dispute between state agencies and the Federal Energy Regulatory Commission (FERC) over the control of LNG facility.
60 See infra part II A.
61 Lowe, supra note 36.
62 Id.
64 Id.
Tcf, as of January 2009, and according to the Nigerian Government they could be as high as 660 Tcf. The deposits can be found in stand-alone fields (gas known as non-associated or dry gas), and in fields where gas is associated with crude oil (called associated gas or casinghead). Exploitation of this latter category would permit Nigeria to reduce its flare rate and consequently to decrease greenhouses gas emissions. If, as purported, the Nigerian gas is rich in liquids, then there should exist a potential market to sell butane, propane, and liquefied petroleum gas. Historically, associated gas was flared in the course of oil production, because unmarketable, either that the well is too far from a pipeline connection, the gas is sour (gas that contains hydrogen sulfide in concentrations that exceed pipeline or sales specifications) or there is no market demand for the gas. Apart from being considered an inconvenient byproduct of oil exploration, the discovery of gas deposits in the North Sea initially rendered Nigerian gas useless. But with the depletion of these reserves, exploitation of the Nigerian gas is becoming topical again. That Nigeria has sufficient gas to fill the TSGP looks to be its best card against its rival Nabucco. Nabucco is a planned pipeline that would bring gas from the Middle East and Central Asia to Europe via Turkey, Bulgaria, Romania, and Austria, but the viability of which is facing a serious supply problem.

G. An Alternative to Russian Gas

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67 Id. at 403.
68 Lowe, supra note 36.
69 Duruigbo, supra note 66, at 404-405.
Like Nabucco, the TGSP is touted as an alternative to Russian gas supplies for the European countries. A successfully completed TSGP could reduce European reliance on Russian energy supply, a dependency which was highlighted by the recurrent disputes these last years between Russia and Ukraine that led or were on the brink to lead to interruptions of gas supplies to Europe. Eighty percent of the gas originating in Russia being shipped across Ukraine, this situation prompted the European countries to urgently undertake new projects. The South Stream Pipeline and the North Stream pipelines have then been launched but, even if their route does not go through Ukraine, with both, remains the downside of the reliance on Russian sources.

To bypass Russia and limit its stranglehold on European gas supplies, the European Union has been backing the idea of a corridor from Central Asia that will pass through Azerbaijan and Georgia, and into Turkey. From there, it would link with the Nabucco pipeline, which is hoped to carry 30 billion cubic meters annually. An intergovernmental agreement between Turkey, Romania, Bulgaria, Hungary, and Austria was signed by the Prime Minister of each of these countries on July 13, 2009 in Ankara. Final decision as to the construction of the pipeline is expected for late 2010. Skepticism surrounds the actual possibility to secure enough gas for this route. Turkmenistan is indeed already bound by a 25-year export agreement signed with Russia in 2003 and is building a 40-billion-cubic-meter pipeline eastward to China. Azerbaijan, another prospected supplier, may face a risk in 2020 of no longer being self-sufficient in oil, which would result in a significant increase of the use of gas in the domestic

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71 African Nations Sign Deal for Trans-Saharan Gas Pipeline, supra note 6.
72 Leal-Arcas, supra note 70, at 409.
market and leaving smaller volumes available for Nabucco.\textsuperscript{76} Iraq, also listed as option, is said to have enough natural gas to fill at least five Nabucco-sized pipelines but many Iraqi politicians prefer to keep their gas for domestic consumption and export through the Persian Gulf.\textsuperscript{77} Finally, Iran recently stated that they will fill half the capacity of Nabucco but the Nabucco consortium denied there is an agreement.\textsuperscript{78} Obviously, if Iran, owner of the second-biggest gas reserve in the world after Russia, is called to play a role in the project, the supply problem will likely be solved. But, in addition to this supply issue, Nabucco also poses a significant security threat. Russia’s incursion into Georgia in August 2008 showed how vulnerable is that route, the risk of renewed hostilities in this region remaining high.\textsuperscript{79} To utterly skirt the Russian territory, the European Union has then been looking south toward Africa and the idea of the TSGP carrying Nigerian gas north across the Sahara.\textsuperscript{80} Unfortunately for Europe, this project is also far from being uncomplicated, only by considering the security issue.

II. WHY THIS PROJECT MIGHT NOT WORK

The security issue and the financial crisis appear to be the two major reasons why the project could not work.

A. The Terrorism Risk

“It would be like building a pipeline through Afghanistan – it would be bombed and attacked all the time”.\(^{81}\) This quote illustrates the widespread idea that the most significant obstacle to the financial viability of the TSGP is the terrorism issue.\(^{82}\) In the three countries through which the pipeline will run, the project is likely to be marred by serious security hitches.

i) Nigeria

- The Niger Delta Insecurity

In Nigeria, the originating point of the resources that will be transported through the pipeline to Europe, the Movement for the Emancipation of the Niger Delta (MEND) threatened to thwart the project by sabotaging the construction works.\(^{83}\) The MEND warning came just after last July Nigeria, Niger, and Algeria signed the agreement to start the process of constructing the TGSP.\(^{84}\) The MEND is a militant group asserting that the foreign petroleum companies exploit

\(^{81}\) EU Seeks Best of Bad Options for Energy Security, see supra note 73.  
\(^{83}\) Id.  
\(^{84}\) Eric Watkins, Nigerian Militants Threaten Proposed Trans-Sahara Gas Line, OIL & GAS JOURNAL, July 7 2009; MEND warned the investors to the TSGP that “unless the Niger Delta root issues have been addressed and resolved, any money put into the project will go down the drain”; available at http://www.ogj.com/index/article-display/3118642441/articles/oil-gas-journal/transportation/pipelines/articles/nigerian-militants.html.
the land of the residents (the Ijaw of Warri) of the Niger Delta while not providing a reasonable share of the petroleum profits in return.\textsuperscript{85}

Since 2006, the MEND has been targeting these foreign petroleum companies, kidnapping employees as well as damaging refineries and pipelines to disrupt oil production and inflict economic loss.\textsuperscript{86} MEND’s sabotage operations have led to a significant drop in Nigeria’s oil production, which has fallen to 1.8 million barrels/day in 2009 from 2.6 million barrels/day in 2008.\textsuperscript{87} Against the warning of the MEND militants, Nigerian military forces have replied that they would be able to protect all oil and gas installations, as well as the sector’s workers and staff.\textsuperscript{88} Despite such reassurance, it remains hard not to take seriously MEND’s threats to the TSGP seriously, as 1,037 kilometers will run through Nigeria.\textsuperscript{89} If government and private security forces cannot protect the country’s oil infrastructure in the Niger Delta and the most populous city of the country, Lagos, where MEND’s attacks already occurred, one sees with difficulty how the protection of a more than 1,000 kilometers pipeline can be guaranteed.\textsuperscript{90}

- The October 25, 2009 cease-fire

A recent fact that could modify this analysis is the cease-fire ordered by MEND militants October 25, 2009. MEND declared that its militant will stop bombing oil pipelines for an unspecified period to permit high-level negotiations with the government that could cement a more-lasting peace in the Niger Delta region.\textsuperscript{91} One can be skeptical about this cease-fire since

\begin{itemize}
\item \textsuperscript{86} Id.
\item \textsuperscript{87} \textit{Nigerian Militants Threaten Proposed Trans-Sahara Gas Line}, supra note 84.
\item \textsuperscript{88} Id.
\item \textsuperscript{89} \textit{Is the Trans-Sahara Gas Pipeline a Viable Project? The Impact of Terrorism Risk}, supra note 82.
\item \textsuperscript{90} Id.
\end{itemize}
cease-fires have a history of failing to hold in the Niger Delta. But one can also consider that the conciliatory gesture of the Nigerian President to allocate 10% of revenue from Nigeria’s oil joint ventures with foreign companies to Niger Delta residents will have a real impact in terms of mitigation of the security risk. It follows the unconditional pardon offered last August by the federal authorities to rebels who agree to lay down their arms and assemble at screening centers over the next 60 days.

Equity participation could provide a sense of ownership to community members in the oil and gas industry, which would curtail any propensity for destruction of exploration assets or disruption of production. However, there seems to be impediments to this solution. First, the political feasibility of this option is questionable since Nigeria’s oil and gas resources are predominantly located in minority areas, while national politics are dominated by majority ethnic people from non-oil-and-gas producing areas; extracting industries revenues playing a key role in maintaining their hold on power, relinquishing their tight control could be considered politically suicidal. Another hurdle to the Delta Niger residents’ access to equity participation in ventures such as the TSGP, is their lack of financial resources to acquire a stake. To solve this issue, the federal government could undertake what lenders do in a context of project finance: advance loans to the local communities and be paid back from the projects themselves. But unless accountability mechanisms ensure that benefits will properly be used, local participation or not, the risk is that money will be wasted. Local and federal officials have often been found to divert

92 Id.
93 Id.
95 Duruigbo, supra note 66, at 448-449.
96 Id. at 444-445.
97 Id. at 448-449.
petroleum revenues for their own purposes. 98 In other words, corruption in Nigeria is pervasive 99 and could undermine the benefits of a local equity participation in the TSGP project.

One way to address this issue, feature of a phenomenon known as the resource curse or paradox of plenty 100 could be the setting up of offshore trusts funds and an aggressive policy of information disclosure through the Extractive Industries Transparency Initiative. 101 What is sure is that both steps, from the federal government and from the rebels, are too recent in order to judge their effective implementation and the significant impact they are susceptible to have on the petroleum industry in the Delta Niger and on the TSGP in particular.

ii) Niger

“The weak spot is Niger, which, with its sparse population, vast terrain and undeveloped security infrastructure, would find it hard to muster the intelligence and deployment capabilities required to deter and monitor potential threats”. 102 In Niger, the threat is epitomized by the Tuareg guerilla movements and its leading organization Le Mouvement des Nigériens pour la Justice (MNJ). Tuaregs are Berber-speaking pastoralists (estimated to be 900,000 in the late 20th century) who inhabit an area in North and West Africa with political organizations extending

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98 Nigeria Militants Order Cease-Fire to Permit Talks, supra note 91.
99 Emeka Duruigbo, The World Bank, Multinational Oil Corporations, And the Resource Curse in Africa, 26 U. PA. J. INT’L ECON. L. 1, 23 (2005); see also Duruigbo, supra note 66, at 428: “The story of the pervasive and corrosive monster of corruption in Nigeria is legendary. Nigeria has consistently ranked low in Transparency International’s Corruption Perceptions Index. Corruption, which has a pernicious effect on economic growth, is evident in every layer in Nigerian society. The immediate past administration of President Olusegun Obasanjo commenced steps to tackle corruption through the creation of an anti-corruption commission and an Economic and Financial Crimes Commission (EFCC), but the country is still awaiting substantial progress on this issue.”
100 Duruigbo, supra note 66, at 423 quoting Naomi Cahn, Corporate Governance, Divergence and Sub-Saharan Africa: Lessons from out there in the fields, 33 STETSON L. REV. 893, 910 (2004): “the paradox of plenty is a term generally reserved for the situation in which some countries, notwithstanding the plenitude of natural resources in their domain, have the unfortunate experience of underperforming in virtually every area of national endeavor: politically, economically, and socially”.
101 Duruigbo, supra note 99, at 33 passim; see also infra part III E.
102 TSGP: A Trans-Saharan Mirage, supra note 8.
across national boundaries (e.g. Algeria, Mali, Niger, Libya). The conflict that opposes the Tuaregs to the central government of Niger is narrowly related to the uranium industry. As with the MEND in Nigeria, the MNJ in Niger asserts that the foreign extracting companies, Areva (French giant in civil nuclear energy) in particular, exploit the land of the Tuaregs while not providing a reasonable share of the profits generated by the activity. As in Nigeria, rebels have been targeting foreign workers as well as governmental soldiers and officials; in this country too, national politics are dominated by ethnic people from the non-uranium area. In the Agadez region where most Tuaregs live and where the TSGP is supposed to run across, since 2007, human rights organizations have been denouncing arbitrary arrests, summary executions of civilians, tortures, rapes, lootings, and herd slaughters, cattle often being the unique source of revenue for local population.

Lately, the insurgency has wound down nevertheless, especially since January 2009, when the Areva’s interest in Niger was renegotiated with the concession grant of the Imouraren mine, considered as the most important uranium mine in Africa and the second in the world. A local stake would have been proposed to the rebels in exchange of dropping the weapons.

However, this reprieve could not last. Two factors may spark a fresh upsurge of violence in the region. One is the lingering tension between the Tuaregs and Areva. On September 15, 2009, the criminal court of Paris dismissed an action brought by the organization Alhak-en-Akal representing the Tuaregs of Niger against a director of Areva, alleging that he expressed racist sentiments “by inviting the French government to give to the Nigerien Government the means of


\[105\] Id.


\[107\] Id.
subduing the Tuaregs, these men in blue (because Tuaregs wear a tagelmust which is a kind of indigo veil/turban) by giving the men a dream and the women a hope which in reality is nothing but an illusion.”

The tribunal dismissed the accusation, holding that it does not have jurisdiction over such matters. Beyond the suit itself, this dispute shows that there is a strong resent against Areva in this region of Niger, for alleged economic and environmental abuses, feeling exacerbated by the fact that Areva being mostly owned by French shareholders, France, through this company, is accused to act in Niger as if this country is still its colony. With regard to the TSGP, the project could be a target to put pressure on the central government and on Areva, so that they consent to more benefits for the local population. In terms of political risk, civil unrest (sabotage) is the prevalent threat but should Total be involved in the TSGP, expropriation may become another threat. Total is indeed seen as a prominent symbol of French neocolonialism in Africa.

The grant of the concession of the Imouraren mine as well as the preliminary intergovernmental agreement for the TSGP was decided by President Mamadou Tandja, whose

111 Elf Aquitaine, which will be taken over by Total in 2002, epitomizes this criticism of French neocolonialism, coined by the concept “Françafrique” described in the seminal book written by FRANÇOIS-XAVIER VERSCHAVE, LA FRANÇAFRIQUE, LE PLUS LONG SCANDALE DE LA RÉPUBLIQUE, (Stock 1998). The summary of his criticism in English is available at http://survie.org/francafrique/article/defining-francafrique-by-francois: I coined the term “Françafrique” to describe the tip of the iceberg that is Franco-African relations [...] the term refers to the secret criminality in the upper echelons of French politics and economy, where a kind of underground Republic is hidden from view. In 1960, events forced De Gaulle to grant independence to the French colonies of black Africa. This newly-proclaimed international legality was the unsullied tip of the iceberg: France as the best friend of Africa, development and democracy. Meanwhile, Jacques Foccart, “the man in the shadows”, was given the task of maintaining dependence, using inevitably illegal, secret and shameful methods. He selected heads of state who were “friends of France” - through war (more than 100 000 civilians massacred in Cameroon from 1956 on; the Madagascan resistance was broken in 1947 by carnage of a similar magnitude), assassination or electoral fraud. To these guardians of the neo-colonial order, Paris offered a share of the income from raw materials and development aid. Military bases, the CFA franc which could be exchanged in Switzerland, the secret services and the outwardly-innocent businesses acting on their behalf (Elf and numerous supply or “security” companies) completed the system.
regime was overthrown by a junta February 18, 2010. He was accused of autocratic drifts and the political tensions surrounding this coup represent the second factor that could spark violence in the country. In May 2009, by an alleged sham referendum, President Mamadou Tandja amended the constitution to remove the cap of two terms, making him eligible for a third one, and remaining in office for at least three more years. A risk of civil riots, similar to what just occurred in Guinea is highly feared in the event the transition back to civilian rule is not brief.

If eventually no expropriation occurs, at least the current situation in Niger makes the climate investment very uncertain and as a result the TSGP could be halted. Political collapse and succession is a risk to consider. This risk is that the party achieving power will seek to undo some portion or all of the predecessor party’s work in connection with support of a project. History has shown that there are warning signs that might suggest the risk is more likely, such as corruption, low degree of perceived openness of government in awarding contracts, contracting that does not appear to reflect terms received in similarly situated countries. Thus, the new government may not only overthrow the current regime but may also reverse its previous decisions, as a means of correcting perceived corruption or cronyism. This risk should not be overlooked for Niger. As in Nigeria, solutions to mitigate the risk could be both local equity participation and aggressive transparency initiatives.

113 Thomas Hofnung, Tandja s’accroche au pouvoir, LIBERATION, May 6, 2009, available at http://www.liberation.fr/monde/0101565695-tandja-s-accroche-au-pouvoir. As to the situation in Guinea, see http://topics.nytimes.com/top/news/international/countriesandterritories/guinea/index.html. In Guinea, Sep. 28, 2009 a peaceful pro-democracy rally took a violent turn when Guinean presidential guard troops opened fire on tens of thousands of demonstrators. Up to 157 people were killed. As in Niger, tension is high because of the questionable legitimacy of the government that is accused to byp ass democratic rules in order to remain in place and brutally quell opposition to that effect. See also, supra note 112.
114 HOFFMANN, supra note 30, at 51.
115 Id. at 52.
116 Id. at 52.
iii) Algeria

In this country, the threat comes from the main Algerian insurgent movement, the Salafist Group for Call and Combat re-branded itself in 2007 as Al Qaeda in the Islamic Maghreb (AQIM).\textsuperscript{117} As its ‘mother organization’, AQIM’s aim is to oppose what its leaders considered corrupt Islamic regimes and foreign presence in Islamic lands.\textsuperscript{118} While the insurgency still has its original battleground in Algeria, and is still dominated by veterans of Algeria’s civil war, the past few years, Algerian security forces succeeded at containing the violence at home.\textsuperscript{119} This success forced the rebels to begin mounting operations in neighboring countries, among them Niger.\textsuperscript{120} In addition to the Tuaregs, AQIM poses a serious threat to the TSGP, because of the bickering between the involved countries, Mali and Mauritania both having strained relations with Algeria.\textsuperscript{121} Also, the Algerian security forces concentrate on wiping out AQIM in the northeast of the country and Mali and Niger are intent on solving their Tuareg insurgencies. As a result, regional summits to tackle the cross border terrorism problem have been repeatedly postponed, making possible for AQIM rebels to exploit the void left by these three countries.\textsuperscript{122} So far, AQIM rebels have not struck at Algeria’s oil and gas infrastructure, but have killed soldiers and ‘western’ citizens; they also abducted tourists to obtain ransoms to fund their

\textsuperscript{119} This means no more large-scale massacres as during the civil war, but there are still ambushes by AQIM affiliates, the latest dated October 22, 2009, that killed six security guards who were protecting workers of the Canadian public works company, SNC Lavallin. For an analysis on the AQIM attacks in Algeria, see Scott Stewart & Fred Burton, \textit{Algeria: Taking the Pulse of AQIM}, STRATFOR GLOBAL INTELLIGENCE, June 24, 2009, available at http://www.stratfor.com/weekly/20090624_algeria_taking_pulse_aqim.
\textsuperscript{121} Id.
\textsuperscript{122} Id.; see also \textit{Is the Trans-Sahara Gas Pipeline a Viable Project? The Impact of Terrorism Risk}, supra note 82.
activities. The Wall Street Journal map below sums up the past Sahara attacks attributed to AQIM in 2008 and 2009.\textsuperscript{123}

\begin{center}
\includegraphics[width=\textwidth]{sahara_map.png}
\end{center}

At first sight, the terrorist threat to the TSGP looks high and the prevalent reason why this project could not work. Indeed, security supply is more important for gas than oil, because gas outages involve much greater reconnection problems.\textsuperscript{124} For oil products the loss supply incurs outage costs, but when supply is restored, reconnection is quite simple. Conversely, with gas, there is a danger that appliances may not have been switched off or that air may have entered the pipes, supply restoration ideally requiring a gas engineer at every burner tip.\textsuperscript{125} The inflexibility in gas supply network means it is difficult to replace lost supply quickly.\textsuperscript{126} In the

\begin{footnotesize}
\textsuperscript{123} Islamic Rebels Gain Strength in the Sahara, supra note 117.
\textsuperscript{124} Cross-Border Oil and Gas Pipelines: Problems and Prospects, supra note 10, at xiv.
\textsuperscript{125} Id. at 6.
\textsuperscript{126} Id.
\end{footnotesize}
case of the TSGP, the pipeline will need constant patrolling and surveillance system to protect the infrastructure from terrorist sabotage, which will raise costs beyond profitability and could eventually tip the balances in favor of the LNG option.\textsuperscript{127}

B. The Financial Crisis

The gas market is depressed, and as a result, gas companies are struggling to raise finance.\textsuperscript{128} Moreover, while some analysts suggest that prices have bottomed out, others say they may have further to fall.\textsuperscript{129} As to the potential investors in the TSGP, Gazprom is encountering financial troubles and, in September 2009, Standard & Poor’s lowered its credit rating on Shell by a notch to AA and its rating outlooks on Eni and Total, to negative from stable.\textsuperscript{130} This decline of gas price reflects not only the recession-driven drop in demand for the fuel from utilities and industrial consumers, but also a big glut of gas production in North America.\textsuperscript{131} As a result of those factors, European energy companies have bought far less natural gas from Gazprom this year than they are obliged to under the long-term purchase agreements.\textsuperscript{132} It is an unprecedented situation and it shows that if, at current levels in demand, gas were transported through the TSGP, it would be unnecessary for the European market. However, some expert predictions believe things could look more positive after a few years.\textsuperscript{133} Assuming then that the long-term demand keeps growing, the issue will be for the actors to agree on the price that has to be paid. So far, to make the natural gas competitive with alternative fuels, contracts (for natural

\begin{footnotesize}
\begin{itemize}
\item[\textsuperscript{127}] \textit{Is the Trans-Sahara Gas Pipeline a Viable Project? The Impact of Terrorism Risk}, supra note 82.
\item[\textsuperscript{129}] Id.
\item[\textsuperscript{133}] \textit{No Uptick Seen for Natural Gas Prices, ENI says}, supra note 131.
\end{itemize}
\end{footnotesize}
gas) have been indexing to the price of oil, but spot prices have decoupled from long-term prices after the economic slowdown.\textsuperscript{134} The disparity is such that a purchaser may resist signing this oil link clause\textsuperscript{135}, thus jeopardizing the project feasibility, since there is a high risk that the revenue generated may not be sufficient to cover the investment. Again, the possibility of re-pricing and to which extent, seems to be a crucial issue in structuring this cross-border pipeline. This issue is addressed below.

\textsuperscript{134} Id.

III. STRUCTURING THE TSGP PROJECT - AVAILABLE INSTRUMENTS TO ADDRESS THE PHYSICAL, POLITICAL, AND ECONOMIC ISSUES INHERING IN CROSS-BORDER PIPELINES

A. Overview Of The Physical, Economic, and Political Issues Inhering In Cross-Border Pipelines

The fundamental economics of a petroleum infrastructure such as the TSGP are large upfront capital investments, low salvage values and a long payout period. Building a cross-border pipeline is a capital intensive activity because pipelines are subject to very large economies of scale due to the exponential relationship existing between the capital cost and the carrying capacity (carrying capacity = square of the radius of the pipeline). Most of the costs go to the laying of the pipeline and construction of the pumping stations, and are thus independent of the throughput. The structure of pipelines costs is consequently characterized by high fixed costs and low variable costs (for specific maintenance and fuel to the pump). These high fixed costs are sunk costs (costs incurred in a project that cannot be changed by present of future actions), meaning that the bygones rule is powerful in pipelines. This rule means that even if losses are incurred, provided that variable costs are covered and some contribution is being made to fixed costs, continued operation (despite its loss minimizing...
consequences) is preferred to closure.\textsuperscript{142} Another factor to take into account in gas pipelines is that if the flow of gas is interrupted, unlike for oil, there are no alternative means to bring it to consumers.\textsuperscript{143} Likewise, if in the case of oil the producer has the opportunity to sell elsewhere and the consumer the opportunity to purchase from elsewhere, as far as gas is concerned, producers and consumers are tightly linked by the pipeline output and, any interruption to the flow risks devaluing the investment.\textsuperscript{144} As a result of all those considerations, obsolescing bargaining\textsuperscript{145} is a major risk in cross-border gas pipelines.\textsuperscript{146}

Obsolescence bargaining means that, once the investment is in place, the advantage shifts through time from the investment supplier (petroleum companies) to the investment recipient (host countries), obsolescence usually taking the form of renegotiated contracts, higher taxes, and expropriation.\textsuperscript{147} If initially the host country may be in a poor bargaining position, once the petroleum company has invested large capital, the interest of this petroleum company is to want the project keep running as long as possible. In the meantime, the host country – aware that the petroleum company has now too much to lose by withdrawing – becomes in a position where it can claim for more benefits. Properly structuring the TSGP necessarily implies to address this concept of obsolescing bargaining (and the risk of supply disruptions to the consumer nations it carries).\textsuperscript{148}

Not only disputes between foreign investors and host countries should be anticipated but also disputes between host countries themselves. Both Nigeria and Algeria export gas and one

\textsuperscript{142} Cross-Border Oil and Gas Pipelines: Problems and Prospects, supra note 10, at 16.
\textsuperscript{143} Cross-Border Oil and Gas Pipelines, Legal and Regulatory Regimes, supra note 136, at 20.
\textsuperscript{144} Cross-Border Oil and Gas Pipelines: Problems and Prospects, supra note 10, at 14.
\textsuperscript{146} Cross-Border Oil and Gas Pipelines: Problems and Prospects, supra note 10, at 16.
\textsuperscript{148} Id. at 10-11.
must wonder what their behavior will be if the competition exacerbates because of the sharply falling demand.149 Also, the situation of Niger as the transit country in the TSGP may evoke the situation of Ukraine for the export of Russian gas to Europe and the lingering disputes between those two countries. The initial compensation agreed upon as transit fees may be considered as insufficient once the TSGP will start operating. Or Niger may not accept future price increases for gas used for its domestic consumption. Therefore, credible threats to avoid all those facets of obsolescing bargain will have to be provided.150 Threats include the ability of one partner to switch to an alternative source of energy or to an alternative route (Nigeria exporting its gas via LNG technology or European consumers purchasing gas from other sources), linking energy access for the transit country to energy access for the downstream country, host countries surrendering a certain degree of sovereignty, creating collateral for the investors outside the government’s jurisdictions.151 The TSGP legal documentation will have to integrate all these physical/economic/political factors.

B. Legal Instruments To Address These Issues - The Two Available Models

Unlike submarine pipelines for which some legal foundation is provided under international law by the United Nations Convention on the Law of the Sea, on-land pipelines such as the TSGP have to depend on specific arrangements to address the specific geopolitical and economic issues inherent in these cross-border projects.152 Two models of cross-border

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149 TSGP: A Trans-Saharan Mirage, supra note 8; see also Duruigbo, supra note 66, at 422.
150 Cross-Border Oil and Gas Pipelines: Problems and Prospects, supra note 10, at 46.
151 Id. at 46-47.
152 Serguei Vinogradov, Cross-Border Pipelines in International Law, 14 NAT. RESOURCES & ENV’T 75, 75 (1999).
pipelines arrangements exist, namely the connected national lines model and the international pipeline agreements model.\footnote{RAINER LAGONI, Pipelines, in ENCYCLOPEDIA OF PUBLIC INTERNATIONAL LAW, at 1033 -1034. See also Michael Dulaney & Robert Merrick, Legal Issues in Cross-Border Oil and Gas Pipelines, 23 ENERGY NAT. RESOURCES L. 247 (2005).}

The first model is a connection of national lines, each section of which is exclusively under the territorial jurisdiction and governed by the domestic law of the State where it is installed.\footnote{LAGONI, at 1034.} The trans-national petroleum transport infrastructure is not considered as a unitary whole; instead it has several owners/operators and is subject to a patchwork of national regulatory systems.\footnote{Cross-Border Oil and Gas Pipelines Legal and Regulatory Regimes, supra note 136, at 30.} Cross-border issues are regulated with contracts concluded between the owners/operators of each section as well as by agreements with the respective governments.\footnote{Id.}

The second model considers the trans-boundary pipeline as a factual and legal unit, which must be protected by an intergovernmental agreement proscribing unwarranted disruption of the flow and undue burdens imposed by excessive transit fees or taxation.\footnote{LAGONI, supra note 153, at 1034.} This second model requires the support of each host and transit country not only for the segment constructed and operated within their respective boundaries but for the entire system.\footnote{Cross-Border Oil and Gas Pipelines Legal and Regulatory Regimes, supra note 136, at 31.} It implies a blending of local and international laws.\footnote{Dulaney & Merrick, supra note 153, at 248.}

From the standpoint of mitigating political risk, the second model carries a major advantage over the first one. A single integrated system will help investors to rely upon a single set of rules, thereby providing them with a more stable, clear, and predictable investment environment. This second model is therefore the one that should be selected to structure the TSGP. The achievement of such an integrated truly international project is possible through the
use of a package of host government agreements for each host state and an intergovernmental agreement between the host states.\textsuperscript{160} This approach is endorsed by the Energy Charter Treaty (ECT) whose fundamental aim is to strengthen the rule of law on energy issues, by creating a level playing field of rules to be observed by all participating governments, thereby mitigating risks associated with energy-related investment and trade.\textsuperscript{161} The ECT even provides host government and inter-governmental agreements for this purpose.\textsuperscript{162}

At the outset of structuring the TSGP, three important aspects have to be contemplated for the success of such a project\textsuperscript{163}: an adequate domestic legal system in host countries providing for protection of property rights, enforceability of contracts and non-discrimination, as well as a regulatory authority with appropriate powers and free from political interference, a sound political framework in the form of a multilateral agreement whose purpose is to facilitate the cross-border cooperation and to minimize the risk of cross-border disputes, and a clear contractual framework setting out commercial relationships between the host governments, producers, shippers, and buyers. In such an international model, the intergovernmental agreements constitute the roof supported by the host government agreements and the commercial contracts.\textsuperscript{164}


\textsuperscript{161} http://www.encharter.org/index.php?id=7 (last visited Nov. 19, 2009).


\textsuperscript{163} \textit{Cross-Border Oil and Gas Pipelines Legal and Regulatory Regimes}, supra note 136, at 21.

\textsuperscript{164} \textit{Id.} at 100.
C. Major Cross-Border Pipeline Issues To Be Addressed in the TSGP Agreements

The major issues to consider with respect to structuring a cross-border pipeline include acquisition of right-of-way, environment, ownership structure, taxation, pipeline capacity allocation, technical standards, and dispute settlement.165

i) Right-of-way/Right-to-land

Regardless the domestic or international nature of the project, right-of-way is a major issue in all pipelines.166 What matters are that procedures granting this right address the need for permanent occupation and tenure over the ground traversed by the pipeline.167 With this concern in mind, the host government is expected to secure right-of-ways for the investor through adequate domestic legislation.168 More precisely, the TSGP agreements have to provide for the grant of means to acquire the necessary land rights, along with a set of related commitments such as respecting the time of acquisition, determining the right of former owners to use the surface once the pipeline is built, proper recordation and maintenance of land rights, and enforcement and protection of those rights.169 Those commitments involve, if necessary, adoption of a special law on eminent domain providing for procedures for compulsory purchase or easements in the public interest.170

165 Id. at 21, 22.
166 Id. at 22.; see also Dulaney & Merrick, supra note 153, at 259.
167 Id. at 22.
168 Id. at 22, 23.
169 Building a Cross-Border Pipeline, supra note 160; see also Dulaney & Merrick, supra note 153, at 259.
170 Cross-Border Oil and Gas Pipelines Legal and Regulatory Regimes, supra note 136, at 23.
ii) **Environmental Considerations**

Environmental considerations have to be addressed as early as the route selection stage, but also after, during the construction stage and the operational stage.\(^\text{171}\) At the route selection stage, the issue is to deal with the different lobby groups that can exert such a power that the most economic route for the pipeline may be not politically possible.\(^\text{172}\) During the construction stage, among the issues that arise are the followings: requirement of roads to transport sections of the pipeline and construction personnel to the construction site, possible removal of the vegetation and topsoil in order to lay the pipeline, risk of fire to the surrounding areas.\(^\text{173}\) And to ensure that the developer complies with environmental regulations once the pipeline starts to operate, the host government may require from the developer to put in place environmental bonds or guarantees. They aim at covering the cost of rehabilitating any damage caused to the environment for non-compliance with the environmental regulations or negligence.\(^\text{174}\)

iii) **Ownership/Corporate structure**

Different combinations (limited liability company, joint-venture, partnership, unit trust\(^\text{175}\)) exist according to which, producers, off-takers, and third-parties may own shares/segments of the pipeline.\(^\text{176}\) With this regard, the TSGP would be a so-called ‘dedicated pipeline’, that is, available for use only by the owner (in contrast with dedicated pipelines there

\(^{171}\) Dulaney & Merrick, *supra* note 153, at 259.
\(^{172}\) *Id.* at 260.
\(^{173}\) *Id.*
\(^{174}\) *Id.*
\(^{175}\) *Id.* at 255-259.
\(^{176}\) *Cross-Border Oil and Gas Pipelines Legal and Regulatory Regimes, supra* note 136, at 23.
are multi-user pipelines with third-parties having rights of access). In this approach, construction and ownership of the pipeline in its entirety are supported by petroleum producers in order to transport their own gas. As a reminder, envisaged interests for the TSGP are 45% each for Nigerian National Petroleum Corporation and Algeria’s Sonatrach and 10% for Niger, but private-sector companies might be taken in.

With respect to the corporate structure, there are two options: either a single entity owns the entire pipeline, or two or more entities own different segments. The single company option carries some advantages over the multiple company option: the single company option will minimize the number of entities involved in the project, which will consequently reduce documentation, corporate formalities, and the need for interface between different entities. The single company option will also help to simplify the operation of the pipeline since the operator(s) will be working under contracts with the same entity. The project company will have to ensure that the pipeline is operated as a unified whole, by setting the operating terms, or coordinating operations (such as maintenance), thereby maintaining the integrity of the pipeline as well as reducing costs and maximizing revenues. The last but not least of the advantages is that with the single company option all the participants have a common commercial interest in the entire system, and consequently have an incentive to ensure the success of all parts of the project.

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177 DENTON WILDE SAPTE, Structuring Cross-border Pipelines, 47 PIPES & PIPELINES INTERNATIONAL 11, 12 (2002).
178 Cross-Border Oil and Gas Pipelines Legal and Regulatory Regimes, supra note 136, at 24.
180 Structuring Cross-border Pipelines, supra note 177, at 13.
181 Id. at 14.
182 Id.
183 Id.
184 Id.
But factors such as state participation and restrictions on foreign investment may command to move away from the single company model.\textsuperscript{185} With respect to state participation, the consideration is whether a state-owned-enterprise (such as Sonatrach in Algeria), has a legal monopoly over gas transportation in the country and whether this public owned entity may be able to share equity in a foreign company.\textsuperscript{186} Once those aspects have been identified, the TSGP agreements will have to address them to accommodate the interests of the different participants. Likewise, the TSGP agreements may have to lift possible restrictions on foreign investment. As the resort to a single company may involve the use of a foreign company, it will be important to determine whether there are restrictions on the powers of foreign companies to own and operate a pipeline.\textsuperscript{187}

iv) Taxation

One of the specific issues the TSGP documentation has to include is defining the tax regime applicable to the project within each State, with the investors seeking to avoid double taxation or otherwise wishing to clearly define and limit costs within a tax efficient structure.\textsuperscript{188} Without harmonization between the countries the pipeline goes through, the burden of taxation may be too heavy for the commercial viability of the project.\textsuperscript{189} The OECD Model Tax Convention has been suggested to serve as a starting point for negotiating project-specific agreements.\textsuperscript{190} The goal to reach is the creation and maintenance of an agreed fiscal regime among the host countries.\textsuperscript{191} Apart from harmonization and clarity in the way in which taxes will

\textsuperscript{185} Id. at 15.
\textsuperscript{186} Id.
\textsuperscript{187} Id.
\textsuperscript{188} Building a Cross-Border Pipeline, supra note 160; see also Structuring Cross-border Pipelines, supra note 177, at 15-16.
\textsuperscript{189} Cross-Border Oil and Gas Pipelines Legal and Regulatory Regimes, supra note 136, at 26.
\textsuperscript{190} Id. at 27.
\textsuperscript{191} Building a Cross-Border Pipeline, supra note 160.
be levied, investors will also seek that the tax regime agreed-upon when the project is decided will not be later altered, and the project viability not be affected by a substantial change of law.\textsuperscript{192} To protect itself against this risk, the investor has to ensure that a stabilization clause encompassing tax matter is provided in the TSGP agreements.

The several ways in which pipelines are taxed, include income tax imposed on the revenue derived by the pipeline owners, land taxes or rates imposed on the rights of way, government foregoing taxation for direct participation in the project, and transit fees.\textsuperscript{193} The transit fees are an essential factor to determine the commercial viability of the TSGP. They have to reflect a reasonable return on the investment.\textsuperscript{194} If transit fees are deemed excessive by investors or prone to abusive changes, they will probably divert those investors to other projects. Transit fees are a negotiated compensation or tax paid to the transit country for the pipeline right-of-way.\textsuperscript{195} Those fees also refer to the preferential terms on which the transit country can lift oil or gas from the line for domestic consumption or payments for transit in kind.\textsuperscript{196} With respect to the setting of the transit fees, two concepts are being used, viz. the opportunity cost concept and the cost of service concept.\textsuperscript{197} The first means that transit fees reflect what the market can bear or if there are alternative routes, the cost of transit through such routes.\textsuperscript{198} The second means that transit fees reflect the cost of transportation service.\textsuperscript{199}

Whatever methodology is eventually selected, investors will have to seek that the ECT restrictions are imposed on host governments. Pursuant to the ECT, contracting parties, although allowed to charge transport levies and tariffs for supervision and administration of transit, are not

\textsuperscript{192} Dulaney & Merrick, supra note 153, at 264.
\textsuperscript{193} Id.
\textsuperscript{194} Cross-Border Oil and Gas Pipelines Legal and Regulatory Regimes, supra note 136, at 24.
\textsuperscript{195} Id.
\textsuperscript{196} Id.
\textsuperscript{197} Id. at 26
\textsuperscript{198} Id.
\textsuperscript{199} Id.
entitled to act unreasonably and in a discriminatory manner with respect to the level of rates charged or their method of application. The sovereign right of the host government to freely establish the level of tariff is limited to an amount that has to be reasonable and non-discriminatory (otherwise the host government may be brought in international arbitration by the aggrieved investor). So far, Algeria and Nigeria are not yet members of the ECT but merely observers, while Niger is not part at all. Therefore, this restriction, if not set forth in the TSGP agreements, will not automatically apply.

v) Pipeline capacity allocation

A classic issue in cross-border pipelines is the allocation of the right to use the capacity in the pipeline. The usual approach is to allocate to each equity owner a right to capacity in the same proportion as its equity ownership interest but, where there is State participation, the capacity may be allocated in different proportions, in particular, if the transit State requires an allocation of capacity to import gas for its own use. As to the TSGP, the basis for the capacity allocation will have to address the fact that the three countries intend to use some of the gas transported for domestic consumption (northern Nigeria, Niger, southern Algeria). As a result, there might not be an issue of excess capacity. But if there is one, excess capacity can be offered to third parties.

200 Id. at 42-43.
201 Id. at 12.
202 Id. at 12-13.
204 Cross-Border Oil and Gas Pipelines Legal and Regulatory Regimes, supra note 136, at 90, referring to the Caspian Pipeline Consortium.
vi) **Technical Standards and Norms**

Although there are no official international technical standards, commonly used standards can apply to cross-border pipelines such as the TSGP.\(^{205}\) These standards can be employed as a basis for a uniform approach and mitigate the risk of discrepancies between the domestic regulations.\(^{206}\) Thus the TSGP agreements may contain a clause similar to the one contained under Article 17 of the 1976 Frigg Field Reservoir Agreement between Norway and UK\(^{207}\):

> The three governments shall consult one another with a view to agreeing common construction and safety standards for the pipeline and shall require the owners of the pipeline to comply with those standards.

vii) **Dispute settlement**

The TSGP agreements have imperatively to provide means to resolve any disputes that may arise during the life of the project.\(^{208}\) The possible disputes can arise between the countries involved in the project, between the host governments and the pipeline investors, and between the pipeline owners/operators and the users (shippers and purchasers).\(^{209}\) The TSGP agreements can either provide for the creation of a special body entrusted with the dispute settlement functions, or they can submit disputes to established international arbitration institutions, such as the International Chamber of Commerce (ICC), the London Court of International Arbitration.

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\(^{205}\) *Id.* at 27; commonly used standards include: American Petroleum Institute, American National Standards Institute, American Society of Mechanical Engineers, British Gas Code of Practice, British Standards Institute, European Standards, Deutsche Institute fur Normung, Institute of Petroleum, International Standards Organization.

\(^{206}\) *Id.*

\(^{207}\) *Id.* at 27-28.

\(^{208}\) *Building a Cross-Border Pipeline, supra* note 160.

\(^{209}\) *Cross-Border Oil and Gas Pipelines Legal and Regulatory Regimes, supra* note 136, at 28.
(LCIA) or the International Centre for Settlement of Investment Disputes (ICSID) for disputes between host governments and investors.  

For foreign investors, submitting a possible dispute with the host government to an off-shore tribunal is a much more preferable option than relying on a local court where they may have a reduced chance to prevail because of a biased tribunal, or at least a tribunal that has to decide a case under pressure from the government. Obtaining off-shore arbitration along with commitment from the host governments to back their state-owned-enterprises obligations and purchase of political risk insurance to cover breach of contract (dispute coverage extended to frustration) appears to offer the best approach to mitigating the risk of dealing with the different state entities that will be involved in the TSGP.

**D. Major Project Finance Issues To Be Addressed in the TSGP Agreements**

The major issues to consider with respect to project financing the TSGP include pricing in the off-take contract, cost overrun in the construction contract, and the force majeure provision in the whole TSGP documentation.

i) **Sale and Purchase Agreement**

Long-term sale and purchase agreements (LSPA) are traditionally used in the international gas market. As in the TSGP example, sellers may spend billions of dollars building processing and transportation facilities to deliver gas to a simple buyer. The LSPA provides the revenue flow that will cover the investment. Structuring a pipeline project typically implies both a LSPA and a gas transport agreement. The purchaser enters into a gas transport agreement

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210 *Id.*


212 Gaille, *supra* note 39, at 646.
with the pipeline company whereby it would commit itself to paying transport tariffs to the pipeline company for the minimum quantities of gas for which the purchaser committed to take or pay under the LSPA with the producer.\textsuperscript{213} While the purchaser’s payment obligation towards the producer will be on a take-or-pay basis, the purchaser’s payment obligation towards the pipeline company will be on a ship-or-pay basis (the purchaser will remain at liberty to instruct the pipeline company not to transport some gas but will have to pay the transport tariff regardless).\textsuperscript{214}

The alternative is to have a gas transport agreement between the gas producer and the pipeline company whereby the gas producer will commit to deliver to the inlet flange of the pipeline for transport by the pipeline company the same quantities of gas for which the purchaser had committed to take or pay under the LSPA, to pay transport tariffs for all gas transported, and to assign to the pipeline company, as security for payment of the transport tariffs, all or part of the revenue stream payable by the purchaser.\textsuperscript{215} In this second option, there is no relationship between the purchaser and the pipeline company. With respect to tariff fees, there are no clear and generally accepted rules to calculate them in international pipelines.\textsuperscript{216} The U.S. practice may be helpful with this regard. Three methodologies are typically used, flat rates, volume incentive rates, and contract rate tariff.\textsuperscript{217}

\textsuperscript{213} Stein, supra note 34, at 282.
\textsuperscript{214} Id.
\textsuperscript{215} Id. at 282-283.
\textsuperscript{216} Cross-Border Oil and Gas Pipelines Legal and Regulatory Regimes, supra note 136, at 25.
\textsuperscript{217} Id., quoting B. Nielson, Tariffs and Other Agreements Relating to Transportation On Interstate Pipelines, in OIL AND NATURAL GAS PIPELINES: WELLHEAD TO END USER (Rocky Mt. Min. L. Fdn. 1995).

- **Flat rates** are charged for transportation between two or more points on the pipeline system; they always remain constant regardless of the volume of oil shipped by any one shipper on that particular segment of the pipeline system.
- **Volume incentive rates** allow a pipeline to build incentives into its rate structure, to entice shippers to transport larger volumes of oil on their pipeline system. Volume incentive rates allow a shipper to ship certain additional volumes on a pipeline system at a discount rate once the shipper has shipped a certain threshold volume of oil on that pipeline within a specified period of time.
As an argument in favor of the TSGP feasibility, we have seen that the predictions about European demand make credible the possibility to reach a LSPA in the case of the TSGP. But we have also considered that the financial crisis and the subsequent sharp drop in gas prices, might affect the pricing to one point where the TSGP can no longer be deemed financeable. Because of the difficulty to predict even the near future in this area, a price-reopener seems to be an inescapable provision in the LSPA. This provision will have to be carefully drafted to address issues such as account timing, possible effect on financing, limitations on the degree of change in price terms or formula, and a process for establishing revised price terms if the parties cannot agree between themselves. The pricing clause typically contains a normal pricing formula to recalculate the price on a regular basis. LSPA can also provide for special price reviews, that is, providing the parties with a right to call for a renegotiation of the price when either the buyer or the seller can demonstrate that the price is no longer appropriate in the light of current market conditions.

From the standpoint of the lender of the pipeline company in a project finance context, it is important that the gas transport agreement provides a transport tariff with fixed escalation or a transport tariff indexed to inflation or other factors unrelated to energy prices rather than a transport tariff indexed in accordance with the same formula as the gas price under the LSPA.

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- A contract rate tariff established two different rates available to shippers. The first is the non-contract rate which is available to all shippers on the pipeline who do not enter into a contract. The second rate is the contract rate which is available to any shipper entering into a contract for the transportation of a minimum guaranteed volume of oil during a specified period of time.

218 See supra part I D.
219 See supra part II B.
220 Cogan, supra note 37.
221 See Michael Polkinghorne, Predicting the Unpredictable: Gas Price Re-Openers, 2008, https://www.whitecase.com/files/Publication/ac493b85-9fa0-4bb8-a65e-40ea846b0b25/Presentation/PublicationAttachment/12c4ba32-7d70-4d30-a669-4443d539d0ca/Article_Predicting_the_unpredictable_%20gas%20price_re-openers.pdf.
222 Id. at 3; a model of special price review is provided by the ECT, in the report Putting a Price on Energy: International Pricing Mechanisms for Oil and Gas (2007), available at http://www.enchart.org/index.php?id=218.
223 Stein, supra note 34, at 283.
This choice permits for the pipeline company, and consequently the lender, to avoid exposure to the volatility of energy prices.\textsuperscript{224}

As to the process for establishing revised price terms if the parties cannot agree between themselves, the LSPA usually provides for a two-tiered approach. This approach consists first in appointing a single expert to settle the dispute, and in the event one party challenges the expert’s decision, in resorting to an arbitral tribunal.\textsuperscript{225}

Since Europe will be the purchaser of the TSGP gas, specific considerations related to European regulations have also to be in mind when drafting the LSPA. Pursuant to European competition law, destination restrictions, use restrictions, and restrictions on gas sellers are likely to be deemed for having as their object or effecting the prevention, restriction, or distortion of competition in the E.U.\textsuperscript{226}

Another aspect to address when parties want to split-stream sales or one of them want to delay marketing of its share of gas is balancing. A balancing agreement will provide for all rights and obligations arising from disproportionate takings and adjust physical gas takes or deliveries to what should have been taken or delivered.\textsuperscript{227}

\begin{itemize}
  \item[ii)] \textbf{Construction/Cost Overrun}
  
  Cost overruns are not unexpected in construction of such large and complex facilities.\textsuperscript{228}
\end{itemize}

To illustrate this, not earlier as this fall 2009, the West African Gas Pipeline Company, which is the special purpose vehicle created to own the West African Gas pipeline, announced that costs

\textsuperscript{224} Id.
\textsuperscript{225} Polkinkhorme, at 6.
will soar from $600 million to $1 billion.\textsuperscript{229} The completion of this 678 kilometers pipeline starting from the gas reserves in the Delta Niger (like the planned TSGP) to supply Benin, Togo, and Ghana has been delayed for alleged vandalism but, lack of efficiency in the management also came up.\textsuperscript{230} In the context of project financing, this cost overrun may result in increased debt services costs, unavailability of sufficient funds to complete construction, and even if funded by debt, in the inability of the project company to pay increased debt service during operation.\textsuperscript{231} Among the factors that lately have been contributed to cost overruns, developers have cited increased costs of labor, equipment, materials and permitting, weather delays, scarcity of experienced contract workers.\textsuperscript{232}

The usual way to mitigate the cost overrun risk is for the project company to conclude a lump sum turnkey contract with the contractor that requires the latter to provide the complete scope of construction work, for a fixed price, for completion and delivery by a date certain, which performs at agreed-upon levels.\textsuperscript{233} But other options exist such as infusion of equity by project sponsors, standby equity participants, establishment of an escrow fund or contingency account in case of cost overrun.\textsuperscript{234} Also, management experience and permitting, which both are recurrent reasons put forward to explain cost overrun, should be addressed in the TSGP agreements. In addition to the elements above, a lender will expect a comprehensive insurance program covering all insurable risks during construction.\textsuperscript{235}

\textsuperscript{230} Id.
\textsuperscript{231} HOFFMANN, \textit{supra} note 30, at 166.
\textsuperscript{233} HOFFMANN, \textit{supra} note 30, at 171.
\textsuperscript{234} Id. at 166.
\textsuperscript{235} Stein, \textit{supra} note 34, at 281.

44
iii) Force Majeure

In the energy sector, issues related to force majeure come up frequently and it is highly recommended for the parties to consider not only whether a particular event excuses performance under a particular contract, but also the impact of such non-performance on other contractual obligations.\(^{236}\) The relief available under a force majeure provision first depends in large part upon the precise words used, in particular the specific events listed.\(^ {237}\) With respect to pipelines in particular, they are fixed in place and thus easy targets, increasing the risk of interruption in the event of civil unrest, which is the major threat to the TSGP.\(^ {238}\) Drafters of the project documentation will accordingly have to ensure that acts of sabotage are included in the force majeure provision. Weather-related events deserve the same close attention, especially those possibly involved by crossing the Sahara desert. The relief available will also depend upon the consistency of the force majeure provisions among the project contracts.\(^ {239}\) Parties need to consider their exposure to force majeure events not just as a single contract, but in their contracts as a whole.\(^ {240}\) If not, mismatches, by rendering a force majeure excuse available in one contract but not under other related contracts, can lead to significant losses or even disastrous results.\(^ {241}\) Different options exist to eliminate as much as possible the risk of inconsistencies. The contractor and the project company can agree upon a so-called ‘resurrection clause’, pursuant to which the contractor will not receive relief greater than the relief available to the project company under other relevant contracts.\(^ {242}\) Alternate solutions are standby credit, dedication of


\(^{237}\) *Id.* at 98

\(^{238}\) Lowe, supra note 36.

\(^{239}\) HOFFMANN, supra note 30, at 118.

\(^{240}\) Kelley, supra note 236, at 117.

\(^{241}\) *Id.*

\(^{242}\) *Id.*
reserve funds, and employment of additional labor.\textsuperscript{243} The other ways to mitigate events that are a kind of political force majeure are contemplated below.

E. Political Risk Issues To Be Addressed in the TSGP Agreements

Currency risk, which for foreign investors is a typical political risk in international project financing, can be mitigated through political risk insurance (PRI), product that nevertheless usually protects against currency inconvertibility, but not against currency devaluation.\textsuperscript{244} This risk is more acute in projects involving intensive hard currency-denominated financing and high volumes of income in local currency, which probably will not be the case of the TSGP where the gas will be primarily sold to European consumers, then mostly generating Euros. PRI may also prove useful to protect breach of contracts in case host governments and their state-owned enterprises involved in the TSGP do not honor their commitments pledged in the TSGP agreements. In such case, PRI permits the investor to get compensation through the way of arbitration award default or expropriation coverage.\textsuperscript{245} But to trigger PRI protection, the prerequisite is that the State refuses to abide by the international arbitration award.\textsuperscript{246} That is why, as previously seen, the dispute settlement aspect is critical in the TSGP project.\textsuperscript{247}

Although we noted the possibility of expropriation in Niger, it is civil unrest that is the major threat to the TSGP throughout its route. For the investor, it appears imperative to seek explicit protection against this risk since, under customary international law, unless it can be demonstrated that the host state has assumed the risk of loss to the investor or that the insurgents who destroyed or confiscated the property in question manage to become the government, the

\textsuperscript{243} \textit{Id.} at 119.
\textsuperscript{244} See \textsc{Noah Rubins} \& \textsc{N. Stephan Kinsella}, \textit{International Investment, Political Risk and Dispute Resolution: A Practitioner’s Guide} (Oxford University Press USA 2005).
\textsuperscript{245} \textit{Id.} at 81.
\textsuperscript{246} \textit{Id.}
\textsuperscript{247} \textit{See supra} part III C vii.
host State is not obliged to compensate for damage caused by non-governmental actors such as rioters, rebels, or looters.\textsuperscript{248} This risk can nevertheless be addressed with PRI or investment treaties requiring the host States to provide full protection and security to investors and their assets.\textsuperscript{249} As previously pointed out\textsuperscript{250}, another way to mitigate political violence risk, at least in Nigeria and Niger, would be local equity participation in order to alleviate regional discontent. Or, similarly to what has been done in the case of the Chad-Cameroon pipeline\textsuperscript{251}, a revenue management plan (RMP) could be implemented with ways of distributing the revenues decided at the stage of negotiating the TSGP agreements. Even if many observers pronounce the RMP a failure after the Chad government unilaterally dismantled it following the February 2008 rebel attack, one can also consider the RMP as a first worthwhile experience since it involved delicate matters of sovereignty infringement and, despite that fact, some of the RMP structure is still in place.\textsuperscript{252} But such RMP being contemplated in the case of the TSGP implies participation of the World Bank and the chances of bringing it into the project seem weak since, unlike Chad and Cameroon, Nigeria and Algeria are two relatively wealthy countries.\textsuperscript{253} If a sort of RMP proves to be out of reach, compliance with the Extractive Industries Transparency Initiative (EITI)\textsuperscript{254} standards has to be at least accepted by the TSGP countries. In the perspective of sharing revenues with regional governments, applying the EITI principles, which implementation

\textsuperscript{248} \textsc{Rubins & Kinsella}, at 19-20.
\textsuperscript{249} \textit{Id.} at 20.
\textsuperscript{250} \textit{Supra} part II A.
\textsuperscript{252} \textit{Id.} at 292.
\textsuperscript{253} Duruigbo, \textit{supra} note 66, at 422.
\textsuperscript{254} \textsc{Implementing the Extractive Industries Transparency Initiative: Applying Early Lessons from the Field} 2 (World Bank publications 2008): “The extractive Industries Transparency Initiative was launched in 2002 to improve transparency and accountability in countries rich in oil, gas, and mineral (extractive) resources. It consists of a regular publication of all material oil, gas, and mining payments by companies to governments and all materials revenues received by governments from oil, gas, and mining companies to a wide audience in a publicly accessible, comprehensive, and comprehensible manner.”
is monitored by the World Bank, may serve as a central government’s commitment to good governance, increasing revenue collection, and improving the country’s investment climate.\textsuperscript{255}

\textsuperscript{255} Id. at 1.
CONCLUSION

Because of the significant threats surrounding the TSGP, the feasibility and the success of this particular venture will first depend upon the willingness of the three countries crossed by the pipeline to establish a clear, stable and predictable legal framework addressing as comprehensively as possible the issues inhering in cross-border pipelines, such as the risk of obsolescing bargain. To the extent the TSGP countries seek external partners, namely sponsors and financiers, they will have to provide sound guarantees, involving surrendering of sovereignty (such as submission to international arbitration or availability of off-shore collaterals) as evidence of their commitment to minimize the substantial political risk carried by the TSGP project.
ANNEX 1 – CHECKLIST OF THE MAIN ISSUES TO ADDRESS IN THE TSGP AGREEMENTS

Full-fledged intergovernmental agreements should contain the following principal obligations of the State parties.

- To implement the project, including through the adoption of necessary legislation;
- To secure free and unimpeded transit of hydrocarbons through their territories (non-diversion and non-interference);
- To ensure right-of-way on reasonable commercial terms;
- To ensure investor protection and non-discriminatory treatment;
- To provide necessary authorizations, licenses and permits;
- To permit and facilitate import and export of foreign exchange;
- To provide access to all necessary areas and facilities;
- To permit the free movement of necessary goods and personnel;
- To establish common and consistent approach to tariffs, tolls, transit fees, and taxation;
- To notify and cooperate in emergency solutions;
- To resolve possible disputes through negotiations, special conciliation mechanism (if party to ECT) and international arbitration procedures.

Other issues to be addressed in this documentation include:

- Ownership (private vs. state, transit state ownership vs. capacity rights);
- Identification of reserves (associating the pipeline project with guaranteed and identified reserves of hydrocarbons);
- Allocation of pipeline capacity (both normally and in the case of supply disruption);
- Responsibility for the pipeline protection and security;
- Responsible agency for oversight, planning, construction, and initial operation;
- Safety, environmental, technical construction and operation standards;
- Routing;
- Access and scheduling mechanism;
- Interruptions and emergencies;
- Telecommunications;
- Abandonment;
- Disposal of interest.

Source: Cross-Border Oil and Gas Pipelines Legal and Regulatory Regimes, supra note 136, at 100-101.
ANNEX 2 – CHARACTERISTICS AND CONSEQUENCES OF CROSS-BORDER OIL AND GAS PIPELINES

The Characteristics and Consequences of Cross-Border Oil and Gas Pipelines

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>CONSEQUENCES</th>
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<tr>
<td><strong>Transit</strong></td>
<td></td>
</tr>
<tr>
<td>Requires transit agreement</td>
<td>Involves governments</td>
</tr>
<tr>
<td>May involve competing for markets</td>
<td>Increases the number of players</td>
</tr>
<tr>
<td>May involve competing for volumes</td>
<td>Transit governments have different objectives</td>
</tr>
<tr>
<td>Transit revenues are a zero sum game</td>
<td></td>
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<tr>
<td><strong>Cross-Border</strong></td>
<td></td>
</tr>
<tr>
<td>Need contacts governed by different legal regimes</td>
<td>Different legal and regulatory regimes apply</td>
</tr>
<tr>
<td>Need to move between differing legal and regulatory environments</td>
<td>Differing energy markets are involved (regulation, structure, degree of competition)</td>
</tr>
<tr>
<td>Imports may compete with a national project</td>
<td>Benefits must be shared across the border</td>
</tr>
<tr>
<td><strong>Pipelines</strong></td>
<td></td>
</tr>
<tr>
<td>Subject to economies of scale</td>
<td>The “bygones rule” operates</td>
</tr>
<tr>
<td>High fixed costs</td>
<td>Full-capacity operation is the key to profitability</td>
</tr>
<tr>
<td>Potential for natural monopoly</td>
<td>Requires regulation</td>
</tr>
<tr>
<td>Changing capacity is difficult once built</td>
<td>Limited flexibility</td>
</tr>
<tr>
<td>Long-lived specific projects</td>
<td>Fixed routes once built</td>
</tr>
<tr>
<td></td>
<td>Vulnerable to changing circumstances</td>
</tr>
<tr>
<td>History of state involvement</td>
<td>Regulation exists</td>
</tr>
<tr>
<td></td>
<td>Public versus private interests</td>
</tr>
<tr>
<td>Part of a longer value chain; that is, part of vertical integration</td>
<td>Rent to share</td>
</tr>
<tr>
<td></td>
<td>Rent may be volatile</td>
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<tr>
<td></td>
<td>Regulation required</td>
</tr>
<tr>
<td>Subject to market failure</td>
<td>Regulation required</td>
</tr>
<tr>
<td>-Competition</td>
<td>Public versus private interests</td>
</tr>
<tr>
<td>-Security of supply and strategic importance</td>
<td></td>
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<tr>
<td>-Environmental damage in building and operation</td>
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