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 proposed natural gas pipeline from Nigeria to Algeria designed to supply Europe by connecting to the existing Trans-Mediterranean, Maghreb-Europe, Medgaz and Galsi pipelines across the Mediterranean coast.¹ The length of the pipeline is estimated at roughly 4,200 kilometers (2,609 miles): 1,037 kilometers (604 miles) in Nigeria, 853 kilometers (530 miles) in Niger, and 2,310 kilometers (1,435 miles) in Algeria.² The pipeline would initiate in the swampy region of the Niger Delta basin, then across the cultivated lands and tropical forests of North Nigeria. In Niger, the pipeline would cross the Sahel region, a semi-arid tropical savanna preceding the Sahara desert. Almost half of the proposed route traverses arid expanses before crossing over the Atlas Mountains, finally reaching Hassi R’Mell, a hub for natural gas and oil pipelines running to the Algerian coast.³ The cost of the investment is estimated at $13 billion in U.S. currency: $10 billion for the pipeline, and $3 billion for the gas

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³ Id.
collecting and Nigerian infrastructure. Once functioning, the TSGP is expected to reach a yearly capacity of 1,059 billion cubic feet (thirty billion cubic meters) of natural gas.

On July 3, 2009, Nigeria’s state oil company, Nigerian National Petroleum Corporation, announced that Nigeria, Algeria, and Niger signed an agreement to create the TSGP. For these countries the next step is to seek out commercial partners in order to raise the billions of dollars required to fund the venture. To date, French Total, Italian Eni, Russian Gazprom, Spanish Gas Natural Company, and Anglo-Dutch Shell have expressed interest in joining the project. Inescapably, for all of the investors, is the central question of whether the project is actually financially viable.

The purpose of this Article is to highlight and analyze the factors that are likely to affect an investor’s decision regarding the TSGP project. Part I focuses on arguments that support the necessity and viability of this cross border pipeline. Part II examines factors weighing against the project. Finally, Part III focuses on the main aspects that should be addressed in structuring the TSGP contracts and agreements so as to maximize its potential for success.

I. WHY THIS PROJECT MIGHT WORK

Various elements, from geological to geopolitical, underpin the European need for Nigerian gas. Factors supporting the necessity and viability of this cross-border project are (A) depletion of European gas fields, (B) demand for oil in Europe is likely to remain high, (C) uncertainty over the feasibility of shale-gas production in Europe, (D) the preference for a gas pipeline over liquefied natural gas (LNG) technology, (E) the presence of sufficient Nigerian reserves, and (F) the need for an alternative to Russian gas.


5 Id.


A. Depletion of European Gas Fields

Reserves close to traditional markets, such as Europe, are being depleted, such that these markets must contemplate new, more remote sources of gas to satisfy their needs. The North Sea once held substantial gas deposits, roughly about 546 Trillion cubic feet (Tcf) (15.461 Trillion cubic meters), but these deposits are now almost 60 percent depleted. The primary gas fields in this region are the Groningen Field in the Netherlands, where extraction began in 1959, and the Troll Field in Norway, which has been active since 1979. Production in these fields reached a peak of 11 Tcf per annum in 2004, and is expected to decline gradually in the years ahead. According to the Nord Stream Consortium, as domestic production declines, by 2025 80 percent of the gas the European Union consumes will be imported, compared with 58 percent in 2005. This means the continent will have to import nearly 7.063 Tcf (200 billion cubic meters) more gas a year than it does now.

B. European Demand Potential for Gas Remains High

Natural gas demand in the European Union is expected to rise by 43 percent by 2030 and the amount of additional supplies needed will likely increase from 10 percent in 2015, up to 22 percent in 2020, and to roughly 39 percent in 2030. The factors contributing to the high European demand for natural gas include (1) environmental concerns over greenhouse gas emissions, (2) choice to use natural gas is financially attractive for the electric power sector, (3) a slowdown in European nuclear energy development, and (4) the credibility of reaching an off-take agreement.


10 Id.

11 Id.

12 The Nord Stream Consortium is the joint venture company set up for the specific purpose of constructing and operating the Nord Stream Pipeline, which is a pipeline proposed to link Russia and the European Union via the Baltic Sea. See generally Nord Stream, http://www.nord-stream.com/en/ (last visited Oct. 1, 2010).


14 Id.


16 “An agreement between the project company and the purchaser (off-taker) of the project’s final output, specifying the terms and conditions of the purchase, including price,
1. Environmental Concern over Greenhouse Gas Emissions

According to the 2003 Joint UNDP/World Bank Energy Sector Management Assistance Programme (ESMAP) study, “gas is relatively environmentally friendly, having high conversion efficiencies from useable to useful energy . . . burning natural gas emits only 75% of the NO\textsubscript{x} (nitrogen oxides produced during combustion) and 50% of the CO\textsubscript{2} released by the burning of other hydrocarbons.”\textsuperscript{17} Because natural gas produces less carbon dioxide when it is burned than coal or petroleum, governments implementing national or regional plans to reduce greenhouse gas emissions may encourage the use of natural gas to displace other fossil fuels.\textsuperscript{18}

2. Choice to Use Natural Gas Is Financially Attractive for the Electric Power Sector

Besides a small greenhouse footprint, gas has other advantages such as low capital cost, short lead times, and that it does not have high construction costs, as with nuclear and coal-fuelled power stations, which has made natural gas the best alternative for power generation.\textsuperscript{19} Already “[i]n Europe more than three-quarters of power demand growth has been met by gas-fired power since 2000,” and this trend appears likely to continue.\textsuperscript{20} Furthermore, as a result of deregulating and liberalizing electricity to encourage private sector investment, there is a preference for combined-cycle gas turbine (CCGT) technology which relies on natural gas.\textsuperscript{21}

3. Slowdown in the Development of European Nuclear Energy

While many models, such as those of the International Energy Agency (IEA) and the Oxford Institute for Energy Studies (OIES), have projected Europe’s gas import needs will rise steeply over the long term,\textsuperscript{22} other models point out that renewable energy, which pursuant to the European action plan for Energy Efficiency, must supply 20 percent of electricity by 2020 (20-20-20 programme) as

\textsuperscript{17} Id. at 7 (“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.”).

\textsuperscript{18} ESMAP, supra note 8, at 7.


\textsuperscript{20} Id.

\textsuperscript{21} ESMAP, supra note 8, at 7.

compared with the 8.5 percent that is currently supplied by renewable energy.\(^{23}\)

Subsequently, renewable energy will steal market share from gas and other hydrocarbons in order to reach the 2020 goal.\(^{24}\) This goal seems to be narrowly linked to the development of nuclear energy in Europe, for which a “wide divergence of approaches to nuclear power” remains.\(^{25}\) 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.”\(^{26}\)

The absence of a position on nuclear energy development by 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.

4. **The Credibility of Reaching an Off-Take Contract**

“We’re not going to build this pipeline without long-term contracts,” stated the Algerian energy Minister Chakib Khelil, referring to the project finance technique that will likely be used to develop the TSGP.\(^{27}\) This technique requires an off-take contract, or long-term sales contract, which in turn requires that demand for such production of gas is met so that a buyer is willing to commit itself for a substantial period of time. Although large scale projects in developing countries, such as the TSGP, can be financed through public funding, this approach engenders significant potential exposure for public finances. A country funding the project would bear most of the risks associated with their participation.\(^{28}\) Placing this heavy burden on public resources often results in a deterioration of fiscal conditions.\(^{29}\) To limit public expenditures and its negative consequences, such as tax increases and lack of funds for other projects, the use of project finance is considered an appropriate alternative because it substitutes private investment for public expenditures.\(^{30}\) As a result, gas pipelines are typically financed through a combination of sponsor equity and project financing. With respect to the TSGP,

\(^{23}\) *Id.*  
\(^{24}\) *Id.*  
\(^{26}\) ESMAP, *supra* note 8, at 7.  
\(^{29}\) *Id.*  
\(^{30}\) *Id.*
Nigeria, Niger, and Algeria plan to finance 75 percent of the cost of the project with borrowed funds.\textsuperscript{31} In order for an off-take contract to work in this situation, a couple of concerns must be addressed.\textsuperscript{32} First, the producer must commit to the purchaser a sufficient quantity of the production such that the gas producer will not sell gas to another market or purchaser.\textsuperscript{33} Second, the parties will want to ensure that the price fluctuates with the value of the product during the entire life of the off-take contract since gas is a commodity and subject to price adjustment.\textsuperscript{34}

Additionally, other essential features of a long-term contract associated with a pipeline project that need to be considered are “take-or-pay,” “ship-or-pay,” and “deliver or pay” clauses.\textsuperscript{35} The “take-or-pay” provision determines the amount of gas, usually 80 percent 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.\textsuperscript{36} In the case of a pipeline project, the “ship-or-pay” provision refers to the commitment of the user (the producer or the purchaser)\textsuperscript{37} to the pipeline company to pay transport tariffs even if the user is not in a position to supply or purchase the gas for transport.\textsuperscript{38} From the purchaser’s standpoint, one important feature is the “deliver-or-pay” clause which will protect a purchaser’s 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.\textsuperscript{39}

Nevertheless, even if there is a steady demand and European purchasers are willing to reach a long-term sales agreement, it will be challenging to craft an agreement for such duration when it comes to the energy market. Indeed, it is hard to predict energy prices a year in advance. It is obviously much more difficult to predict the next fifteen to twenty years, particularly in light of the current financial crisis that has caused the price of gas to dramatically increase.\textsuperscript{40} Therefore, the sales agreement must allow for some flexibility as to the determination of the


\textsuperscript{32} Scott L. Hoffmann, \textit{The Law and Business of International Project Finance} 14 (3d ed. 2008).

\textsuperscript{33} John S. Lowe et al., \textit{International Petroleum Transactions} 1052 (3d ed. 2010).

\textsuperscript{34} Id.

\textsuperscript{35} See S. Scott Gaille, \textit{The Use of Quantity Terms to Improve Efficiency and Stability in International Gas Sales & Purchase Agreements}, 29 ENERGY L.J. 645, 658 (2008).

\textsuperscript{36} See infra Part III.D.

\textsuperscript{37} Id., supra note 31, at 282.

\textsuperscript{38} Stein, supra note 31, at 282.

\textsuperscript{39} See infra Part II.B.
price. In the meantime, for the sake of the project viability, the contract must be rigid enough to be worth signing.\footnote{ESMAP, \textit{supra} note 8, at 6.} Gas pricing, such as a re-opener clause and an oil indexation clause, will be one of the critical aspects in structuring the TSGP project financing and the off-take contract in particular.

\textbf{C. Uncertainty over the Feasibility of Shale-Gas Production in Europe}

As shale gas\footnote{Shale gas is defined as natural gas from shale formations. The shale acts as both the source and the reservoir for the natural gas. \textit{See Facts About Shale Gas}, API (Feb. 1, 2010), http://www.api.org/policy/exploration/hydraulicfracturing/shale_gas.cfm.} is a booming energy source in the United States, companies are now looking for shale gas in Europe.\footnote{Peggy Williams, \textit{Europe Needs Home-Grown Gas}, E&P (Sept. 25, 2009), http://www.epmag.com/WebOnly2009/item45693.php.} At first sight, this factor could weigh against the need for TSGP gas. However, there are substantial differences between the practicality of shale gas development in the United States and Europe such that shale gas is not as viable in Europe and thus should not be considered a threat to the TSGP project. To begin with, European basins are much smaller than the basins in North America, and more geologically complex.\footnote{\textit{Id.}} Furthermore, 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 not grow in Europe as it has in the United States. Among the impediments to a similar boom in Europe are the depth of the deposits, regulatory issues, 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.\footnote{\textit{Id.}; see also David Jolly, \textit{Europe Starting Search for Shale-Gas}, N.Y. TIMES, Aug. 22, 2008, http://www.nytimes.com/2008/08/22/business/worldbusiness/22iht-eurogas.4.1555534.html.} At this point, Europe’s shale-gas appears to offer a meaningful but small target.\footnote{Williams, \textit{supra} note 43.}

\textbf{D. The Preference for a Pipeline over LNG Technology}

Even with a sufficient demand for gas in Europe, the question remains whether a pipeline is the best means to transport the gas from Africa to European customers. Why not use LNG technology instead? This process begins with cooling the gas until liquefied, then shrinking it to 1/600 of its original volume, which permits handling and transportation.\footnote{LOWE ET AL., \textit{supra} note 33, at 1067.} LNG is then shipped in cryogenic tankers to terminals in the importing countries, where it is re-gasified, by reducing the pressure and allowing the liquid to warm, at which point it may be then fed into
local pipelines.\textsuperscript{48} Despite recent improvements, LNG is considered cost-competitive with pipelines only over distances greater than 4,800 kilometers (3,000 miles).\textsuperscript{49} According to this criterion, the 4,200 kilometers (2,609 miles) of the TSGP makes the pipeline more competitive than LNG. However, if the pipelines connecting Algeria and Europe did not already exist, LNG would be more economical.

The disadvantages of LNG include the fact that 15–18 percent of gas is wasted during the process of liquefaction.\textsuperscript{50} Also, the lead time of six to ten years for LNG projects, is longer than in pipeline projects.\textsuperscript{51} Moreover, although the safety record for LNG thus far is excellent, LNG raises critical safety concerns because of the high concentration of energy.\textsuperscript{52} However, LNG import terminals are often subject to virulent protests.\textsuperscript{53} The widespread fear is that LNG ships and terminals are potential targets for terrorist attacks because the gas is explosive during the time it is stored in confined spaces before liquefaction.\textsuperscript{54} But this terrorist threat also exists for gas pipelines, in particular the TSGP, due to the unstable political situations in Nigeria, Niger, and Algeria.\textsuperscript{55} Another criticism associated with LNG is the limited interchangeability, meaning that the gas stream available for exportation may not be compatible with the market to which it is delivered.\textsuperscript{56} The problem is more acute for LNG than for pipelines and even if eventually this interchangeability issue is manageable, it will still bear an extra cost.\textsuperscript{57} With respect to local benefits, both the TSGP and the LNG option would contribute to eliminating natural gas flaring in Nigeria. The TSGP is also alleged to have the critical advantage of supplying gas to Northern Nigeria, Niger, Southern Algeria, as well as Burkina Faso, and Southern Mali which are currently affected by high energy prices and desertification.\textsuperscript{58}

\textsuperscript{48} Id.
\textsuperscript{49} ESMAP, supra note 8, at 3–4.
\textsuperscript{50} Id. at 7.
\textsuperscript{51} Id.; see also LOWE ET AL., supra note 33, at 1073.
\textsuperscript{52} LOWE ET AL., supra note 33, at 1074. LNG shipping can indeed pride itself on not having caused adverse affects to the environment through accidents. Id.
\textsuperscript{53} 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 siting).
\textsuperscript{55} See infra part II.A.
\textsuperscript{56} LOWE ET AL., supra note 33, at 1074 (citation omitted).
\textsuperscript{57} See id.
E. 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 [sic]. To date, [although] Nigeria has never explored for gas, [the] scope for huge growth exists.”59 The abundant gas reserves still untapped in Nigeria hail the merits of the project, but these purported reserves have been called into question.60 As of January 2009, the reserves are estimated at 184 billion Tcf (5.2 trillion cubic meters).61 The deposits are located in stand-alone fields (known as non-associated or dry gas), and in fields where gas is associated with crude oil (called associated gas or casinghead).62 Exploitation of this latter category would permit Nigeria to reduce its flare rate and consequently decrease greenhouse gas emissions. If, as purported, the Nigerian gas is rich in liquids, there is the possibility of production of butane, propane, and liquefied petroleum gas. Historically, in the course of oil production associated gas was flared because it was unmarketable, either because the well was too far from a pipeline connection, the gas was sour,63 or there was no market demand for the gas.64 Apart from being considered an inconvenient byproduct of oil exploration, the discovery of gas deposits in the North Sea initially rendered Nigerian gas useless.65 But with the depletion of the North Sea reserves, exploitation of Nigerian gas is becoming more attractive. Additionally, the fact that Nigeria likely has sufficient gas to fill the TSGP gives it an advantage over its competitor, the Nabucco pipeline which is facing a serious supply problem in the Middle East and Central Asia.66

59 Id.
60 Augé, supra note 4, at 7.
63 Gas is considered sour if it contains hydrogen sulfide in concentrations that exceed pipeline or sales specifications; see Processing Natural Gas, NATURALGAS.ORG, http://www.naturalgas.org/naturalgas/processing_ng.asp (last visited Nov. 27, 2010).
64 LOWE ET AL., supra note 33, at 1027–28.
65 Duruigbo, supra note 62, at 404–405.
F. An Alternative to Russian Gas

The TSGP, as well as the Nabucco pipeline, are touted as alternatives to Russian gas supplies for European countries. A successfully completed TSGP could reduce European reliance on Russian energy supply, a dependency which has been highlighted by the recurrent disputes between Russia and Ukraine resulting in near interruption of gas supplies to Europe. Eighty percent of the gas originating in Russia is shipped across Ukraine, which has prompted the European countries to urgently seek out new sources and pipelines. The recent South Stream Pipeline and North Stream pipelines have provided alternative routes that do not cross Ukraine; however, since these pipelines originate in Russia, Europe still remains dependent on Russian supplies, which European countries seek to avoid.

To bypass Russia, and limit its stranglehold on European gas supplies, the European Union supports a gas pipeline corridor from Central Asia that would cross Azerbaijan, Georgia, and Turkey. From Turkey it would link with the Nabucco pipeline, which is expected to carry 1.059 Tcf (30 billion cubic meters) annually. An intergovernmental agreement between Turkey, Romania, Bulgaria, Hungary, and Austria was signed by the prime ministers of each of these countries on July 13, 2009 in Ankara. A final decision concerning the construction of the pipeline is expected in late 2010. However, skepticism surrounds the actual possibility of securing enough gas for this route. Since 2003, Turkmenistan has been bound by a twenty-five year export agreement with Russia, and is building a 1.413 Tcf (40 billion cubic meter) pipeline eastward to China. Azerbaijan, another prospective supplier, faces the potential risk in 2020 of no longer being self-sufficient in oil, which would result in a significant increase in the use of gas in the domestic market, leaving smaller volumes available for Nabucco. Also, in June 2010, Russian Gazprom signed an agreement with its Azeri counterpart, pursuant to which Gazprom will buy at least 17.657 Tcf (500 million cubic meters)

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67 African Nations Sign Deal for Trans-Saharan Gas Pipeline, supra note 6.
68 Leal-Arcas, supra note 66, at 409.
69 Id.
70 NABUCCO GAS PIPELINE, supra note 66.
75 Id.
a year. This would limit the potential gas that could have otherwise supplied Nabucco. Further, Iraq 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 to export through the Persian Gulf. The other issue is Iraq’s unclear political framework, particularly the uncertainty around the status of the semi-autonomous gas-rich Kurdistan. In late August 2010, the Iraqi Oil Minister deemed illegal the cooperation agreement signed by the Kurdish regional government with the German petroleum company RWE.

Finally, Iran recently stated that it will fill half the capacity of the Nabucco pipeline, but the Nabucco consortium denies there is an agreement. Obviously, if Iran, owner of the second largest gas reserve in the world after Russia, plays a role in the project, the supply problem would likely be solved. In addition to this supply issue, the Nabucco pipeline also poses a significant security threat. Russia’s incursion into Georgia in August 2008 showed how vulnerable that route is, and the risk of renewed hostilities in this region remains high. The European Union has therefore been looking south toward Africa and the idea of the TSGP carrying Nigerian gas north across the Sahara to utterly skirt the Russian territory. Unfortunately for Europe, this project is also complicated by similar security issues.

II. WHY THIS PROJECT MIGHT NOT WORK

While there are plenty of factors supporting development of the TSGP, there are two important issues that must be addressed which weigh against the pipeline, (A) the risk of terrorism, and (B) the financial crisis.

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A. The Terrorism Risk

“It would be like building a pipeline through Afghanistan – it would be bombed and attacked all the time.”

The above quote illustrates the widespread fear that the most significant obstacle to the financial viability of the TSGP is its potential as a terrorist target. In the countries of Nigeria, Niger, and Algeria the TSGP project is likely to face serious security hurdles as discussed below.

1. Nigeria

(a) The Niger Delta Insecurity

In Nigeria, where the pipeline will originate, the Movement for the Emancipation of the Niger Delta (MEND) threatens to prevent the TSGP’s completion. MEND is a militant group which asserts that the foreign petroleum companies exploit the land of Nigeria’s residents, the Ijaw of Warri of the Niger Delta, “while not providing a reasonable share of the petroleum profits in return.” MEND made its position clear by threatening “to thwart the project by sabotaging the construction works.” MEND made this threat just after Nigeria, Niger, and Algeria signed the agreement to start construction of the TSGP in July 2009.

Since 2006, MEND has been targeting foreign petroleum companies, kidnapping employees as well as damaging refineries and pipelines in order to disrupt oil production and inflict economic loss. MEND’s sabotage operations have dramatically reduced Nigeria’s oil production, which has dropped from 2.6 million barrels a day in 2008 to 1.8 million barrels a day in 2009. Against the warning of MEND militants, Nigerian military forces continue to state that the

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82 See id.
85 Id.
86 Eric Watkins, Nigerian Militants Threaten Proposed Trans-Sahara Gas Line, OIL & GAS J., July 7, 2009, at 29 (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”).
87 ENCYCLOPEDIA BRITANNICA, supra note 84.
88 Watkins, supra note 86.
military would be able to protect all oil and gas installations as well as the sector’s workers and staff. Despite such reassurance, it is difficult not to take MEND’s threats against the TSGP seriously as 1,037 kilometers (644.4 miles) will run through Nigeria. MEND has already attacked oil infrastructure in the Niger Delta and the city of Lagos. If government and private security forces cannot protect the country’s oil infrastructure in the Niger Delta and Lagos, the most populous city of the country, it is difficult to see how the protection of more than 1,000 kilometers (621.4 miles) of pipeline can be guaranteed.

(b) The October 25, 2009 Cease-Fire

A fact that could modify this analysis over the long term is the cease-fire ordered by MEND militants on October 25, 2009. MEND declared that its militants “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. Skepticism remains about this “cease-fire since cease-fires have a history of failing to hold in the Niger Delta,” and the statement by a faction of MEND in June 2010 that the cease-fire is over tends to support this feeling. It is possible that the conciliatory gesture of the Nigerian President to share 10 percent of revenue from Nigeria’s oil joint ventures with Niger Delta residents might mitigate the security risk. The Nigerian President’s efforts followed the unconditional pardon offered by the federal authorities to MEND rebels who agree to lay down their arms and assemble at screening centers over a sixty day period.

Equity participation could provide a sense of ownership to community members in the area of the oil and gas industry, which would curtail any propensity for destruction of exploration assets or disruption of production. However, there are potential problems with this solution. First, the political feasibility of this option is questionable since Nigeria’s oil and gas resources are

89 Id.
90 Fabiani, supra note 83.
91 Id.
92 Id.
94 Id.
96 Id.
98 Duruigbo, supra note 62, at 448–449.
predominantly located in minority areas, while national politics are dominated by majority ethnic groups from non-oil-and-gas producing areas. Since extracting industries’ revenues play a key role in maintaining power, relaxing control could be considered political suicide by the majority ethnic groups. Another hurdle to economic access for residents of the Niger Delta is their lack of financial resources to acquire a stake in the oil and gas ventures. To solve this issue, the federal government could undertake what lenders do in a context of project finance—advance loans to the local communities to be paid back by the revenues from the projects themselves. However, local and federal officials in Nigeria have often been found to divert petroleum revenues for their own purposes. Corruption in Nigeria is pervasive and could undermine the benefits of local equity participation in the TSGP project. One way to address this issue, a feature of a phenomenon known as the “resource curse” or “paradox of plenty,” could be to set up offshore trusts funds as well as an aggressive policy of information disclosure through the Extractive Industries Transparency Initiative. However, equity participation and a transparency initiative between the federal government and the rebels are still too recent to measure the effectiveness and impact on the petroleum industry in the Niger Delta.

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99 Id. at 444–45.
100 Id. at 448–49.
101 Swartz & Faucon, supra note 93.
102 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 62, 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 virtually 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.”).
103 Duruigbo, supra note 62, 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) (“[T]he 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.”)).
104 Duruigbo, supra note 102, passim; see also infra Part III.E.
2. 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.”

In Niger, the primary security threat is the Tuareg guerilla movement and its leading organization, Le Mouvement des Nigériens pour la Justice (MNJ). Tuaregs are Berber-speaking pastoralists who inhabit an area in North and West Africa with political organizations extending beyond national borders. Most Tuaregs live in the Agadez region and Agadez is where the TSGP will cross Niger.

The conflict between the Tuaregs and the central government of Niger is narrowly related to the uranium industry. As with MEND in Nigeria, the MNJ in Niger assert that the foreign extraction companies, particularly the French nuclear energy giant Areva, exploit the land of the Tuaregs while not providing a reasonable share of the profits generated by the activity. As in Nigeria, Tuareg rebels have been targeting foreign workers as well as governmental soldiers and officials. In Niger, national politics are also dominated by ethnic groups outside the uranium producing area. Since 2007, human rights organizations have continually denounced arbitrary arrests, summary executions of civilians, tortures, rapes, lootings, and the slaughtering of cattle, the unique source of revenue for the local population, in the Agadez region where the Tuaregs reside.

Lately, the insurgency has been quiet, especially since January 2009, when Areva’s interest in Niger was renegotiated with the concession grant of the Imouraren mine, considered to be the most important uranium mine in Africa and the second most important in the world. A local stake has been proposed to the rebels in exchange for dropping their weapons. However, this reprieve may not last. Two factors may spark an upsurge of violence in the region, the lingering tensions between the Tuaregs and Areva, as well as local political issues.

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105 Brower, supra note 7.
107 Id.
109 Id.
111 Id.
First, 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 subduing the Tuaregs, these men in blue” 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 did not have jurisdiction over such matters. Beyond the suit itself, this dispute shows that there is strong resentment against Areva in this region of Niger. This stems from alleged economic and environmental abuses, feelings exacerbated by the fact that Areva is mostly owned by French shareholders. This has generated accusations that France, through this company, is still treating Niger as its colony.

With regard to the TSGP, the project could be a means of putting pressure on the central government, and on Areva, to consent to more benefits for the local population. In terms of political risk, civil unrest, in the way of sabotage, is the prevalent threat. Should Total be involved in the TSGP, expropriation may become another threat. Total is indeed also viewed as a prominent symbol of French neocolonialism in Africa.

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112 Tuaregs are referred to as “men in blue” because they must wear a tagel which is an indigo veil/turban. See Tuareg, supra note 106.


116 See generally FRANÇOIS-XAVIER VERSCHAVE, LA FRANÇAFRIQUE: LE PLUS LONG SCANDALE DE LA RÉPUBLIQUE (1998) (Elf Aquitaine, which will be taken over by Total in 2002, epitomizes this criticism of French neocolonialism, coined by the concept “Françafrique” described in this seminal book); see also generally François-Xavier Verschave, Defining Francafricque, SURVIE.ORG, (Feb. 18, 2006), http://survie.org/franc africque/article/defining-fancafricque-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
The second factor that may spark an upsurge in violence is the fact that 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 regime was overthrown by a junta on February 18, 2010. The coup took place after months of political tensions and amid accusations of autocratic drifts. In May 2009, by an allegedly fraudulent referendum, President Mamadou Tandja amended the constitution to remove the cap of two terms, making him eligible for a third three-year term. 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.

At the very least, the current situation in Niger makes the climate for investment very uncertain, which poses difficulties for the TSGP. In Niger, political collapse and succession is a risk to consider. The risk being 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.” There are particular warning signs that would suggest that this risk is more likely, such as corruption in the government, a low degree of “perceived openness of [the] government in awarding contracts,” and the contracts do 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 in Niger. As in Nigeria, solutions to mitigate this risk could be both local equity participation and aggressive transparency initiatives.

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.”)

118 Id.
119 Id.
120 See generally Thomas Hofnung, Tandja s’accroche au pouvoir, LIBÉRATION (Fr.), May 6, 2009, http://www.liberation.fr/monde/0101565695-tandja-s-acroche-au-pouvoir; see also Guinea, N.Y. TIMES, June 28, 2010, http://topics.nytimes.com/top/news/international/countriesandterritories/guinea/index.html (Regarding the situation in Guinea, on Sept. 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 of bypassing democratic rules in order to remain in power and brutally quell opposition to that effect.).
121 HOFFMANN, supra note 32, at 51.
122 Id. at 52.
123 Id.
124 Id.
3. Algeria

In Algeria, the primary threat is the insurgent movement, the Salafist Group for Call and Combat, which re-branded itself as Al Qaeda in the Islamic Maghreb (AQIM) in 2007. As with its parent organization, Al Qaeda, AQIM’s aim is to oppose what its leaders consider to be corrupt Islamic regimes as well as foreign presence and influence in Islamic lands. The insurgency’s original battleground is in Algeria, which is still dominated by veterans of Algeria’s civil war. Over the past few years, Algerian security forces have succeeded in containing the violence at home. This success forced the rebels to begin mounting operations in neighboring countries, including Niger. As with the Tuaregs, AQIM poses a serious threat to the TSGP, because of the bickering between Mali and Mauritania, that both have strained relations with Algeria. Algerian security forces are committed to wiping out AQIM in the northeast of the country, and Mali and Niger remain intent on solving their Tuareg insurgencies. Regional summits addressing the cross border terrorism problem have been repeatedly postponed, making it possible for AQIM rebels to exploit the void left by these three countries. So far, AQIM rebels have not targeted Algeria’s oil and gas infrastructure, but they have killed soldiers and western nation citizens, as well as abducted tourists and foreign workers to obtain ransoms to further fund their activities.

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127 See Scott Stewart & Fred Burton, *Algeria: Taking the Pulse of AQIM*, STRATFOR GLOBAL INTELLIGENCE (June 24, 2009), http://www.stratfor.com/weekly/20090624_algeria_taking_pulse_aqim (An analysis on the AQIM attacks in Algeria.); see also Algeria – The Worst Disorder in the Capital, GLOBAL ARAB NETWORK (Oct. 23, 2009), http://www.english.globalarabnetwork.com/200910233310/Algeria-Politics/algeria-the-worst-disorder-in-the-capital.html (Although there are no more large-scale massacres, as during the civil war, there are still ambushes by AQIM affiliates, one of the latest dated Oct. 22, 2009, that killed seven security guards who were protecting workers of the Canadian public works company, SNC Lavalin.).


129 See Stewart & Burton, supra note 127.

130 Fabiani, supra note 83.

131 See Stewart & Burton, supra note 127; see also Fabiani, supra note 83.

The terrorist threat to the TSGP is high and is the most prevalent concern regarding this project. Indeed, security “is more important for gas than oil, because gas outages involve much greater reconnection problems.”\textsuperscript{133} For “oil products, the loss supply incurs outage costs, but when supply is restored, reconnection is simple.”\textsuperscript{134} Conversely, “with gas, there is a danger that appliances may not have been switched off or that air may have entered the pipes, [forcing] supply restoration [to] ideally [require] a gas engineer at every burner tip.”\textsuperscript{135} “The inflexibility in gas supply [networks] means it is difficult to replace lost supply quickly.”\textsuperscript{136} In the case of the TSGP, the pipeline would need constant patrolling and a surveillance system to protect the infrastructure from terrorist sabotage, which could raise costs beyond profitability and ultimately tip the balances in favor of the LNG option.\textsuperscript{137}

\begin{itemize}
\item \textbf{B. The Financial Crisis}
\end{itemize}

The gas market is depressed, and as a result, gas companies are struggling to raise finances.\textsuperscript{138} Moreover, while some analysts suggest that “prices have bottomed out, others say they may have further to fall.”\textsuperscript{139} This decline in gas prices reflects not only the recession driven drop in demand for the fuel from utilities and industrial consumers, but also an overabundance of gas production in North America.\textsuperscript{140} Consequently, European energy companies have purchased less gas from Gazprom this year than they are committed to under their long-term sales agreements.\textsuperscript{141} It is an unprecedented situation and it shows that if, at current levels in demand, gas were transported through the TSGP, it would not be needed in the European market. However, some experts predict that the outlook for demand may return after a few years.\textsuperscript{142} Assuming that the long-term demand continues to grow, the primary issue will be an agreement between the gas sellers and buyers on the price of gas. So far, to make the natural gas competitive with alternative fuels, contracts for natural gas have been indexed to the price of oil, but spot prices have decoupled from long-term prices after the economic slowdown.\textsuperscript{143} This disparity is

\begin{itemize}
\item \textsuperscript{133} ESMAP, supra note 8, at xiv.
\item \textsuperscript{134} Id.
\item \textsuperscript{135} Id. at 6.
\item \textsuperscript{136} Id.
\item \textsuperscript{137} Fabiani, supra note 83.
\item \textsuperscript{139} Id.
\item \textsuperscript{142} Chazan, supra note 140.
\item \textsuperscript{143} Id.
\end{itemize}
such that a purchaser may resist signing this oil link clause.\textsuperscript{144} This may jeopardize 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 its extent will be a crucial issue in structuring the TSGP agreements.

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

A. Overview of the Physical, Economic, and Political Issues Inhering in Cross-Border Pipelines

The fundamental economics of a petroleum pipeline infrastructure such as the TSGP are large upfront capital investments, low salvage values, and a long payout period.\textsuperscript{145} 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 that exists between the capital cost and the carrying capacity.\textsuperscript{146} Most of the costs are in the laying of the pipeline and construction of the pumping stations, and are thus independent of the throughput.\textsuperscript{147} Pipeline costs are consequently characterized by high fixed costs and low variable costs in regards to specific maintenance and fuel to the pump.\textsuperscript{148} These high fixed costs are sunk costs, meaning that the bygones rule is powerful in pipelines.\textsuperscript{149} 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{150} Another factor to take into account is that if the flow of gas is interrupted there are no alternative means to bring it to consumers, as contrasted with oil.\textsuperscript{151} In the case of oil, the producer has the opportunity to sell elsewhere and the consumer has the opportunity to purchase from elsewhere. With respect to gas, producers and consumers are tightly linked


\textsuperscript{147} ESMAP, supra note 8, at 15.

\textsuperscript{148} Id.

\textsuperscript{149} Id. at 16; see also VINOGRADOV, supra note 145, at 20.

\textsuperscript{150} ESMAP, supra note 8, at 16.

\textsuperscript{151} VINOGRADOV, supra note 145, at 20.
by the pipeline output and, any interruption to the flow risks devaluing the investment.\textsuperscript{152} As a result of these considerations, obsolescence bargaining\textsuperscript{153} is a major issue in cross-border gas pipelines.\textsuperscript{154}

Obsolescence bargaining, in this context, means that once the investment is in place, the advantage shifts through time from the investment supplier and the petroleum companies, to the investment recipient and the host countries. Obsolescence usually takes the form of renegotiated contracts, higher taxes, and expropriation.\textsuperscript{155} If initially the host country starts from a poor bargaining position, once the petroleum company has invested substantial capital, the interest of the company is to keep the project running as long as possible. In the meantime, the host country—aware that the petroleum company now has too much to lose by withdrawing—is in a position where it can request more benefits. Properly structuring the TSGP necessarily requires consideration of the concept of obsolescence bargaining and the risk of supply disruptions to the consumer nations.\textsuperscript{156}

Not only should disputes between foreign investors and host countries be anticipated, but disputes between the individual host countries should be considered as well. Both Nigeria and Algeria export gas and one must consider how they may react if there is a sharp fall in demand.\textsuperscript{157} Also, the role of Niger as the transit country in the TSGP is similar to the role of Ukraine in the export of Russian gas to Europe, and thus invokes the lingering disputes between those two countries regarding the transportation of gas. The initial compensation agreed upon for transit fees may be considered insufficient once the TSGP starts operating. Alternatively, Niger may decide against accepting future price increases for gas used for its own domestic consumption. In order to prevent these potential disputes and obsolescence bargaining, there must be some preventative measures in place.\textsuperscript{158} Some examples are: allowing for the ability of one partner to switch to an alternative source of energy or to an alternative route,\textsuperscript{159} linking “energy access for the transit country to energy access for the downstream country,” host countries surrendering a certain degree of sovereignty, or creating collateral for the investors outside the government’s jurisdictions.\textsuperscript{160} The TSGP legal agreements and contracts will have to integrate all these physical, economic, and political factors.

\textsuperscript{152} ESMAP, \textit{supra} note 8, at 14.
\textsuperscript{153} \textit{See} RAYMOND VERNON, SOVEREIGNTY AT BAY: THE MULTINATIONAL SPREAD OF US ENTERPRISES (Basic Books 1971).
\textsuperscript{154} ESMAP, \textit{supra} note 8, at 16.
\textsuperscript{155} Onyeukwu, \textit{supra} note 146, at 10.
\textsuperscript{156} \textit{id.} at 10–11.
\textsuperscript{157} Brower, \textit{supra} note 7; see also Duruigbo, \textit{supra} note 62, at 422.
\textsuperscript{158} ESMAP, \textit{supra} note 8, at 46.
\textsuperscript{159} For example, Nigeria exporting its gas via LNG technology or European consumers purchasing gas from other sources.
\textsuperscript{160} ESMAP, \textit{supra} note 8, at 46–47.
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, land based pipelines such as the TSGP depend on specific arrangements to address the particular geopolitical and economic issues inherent in these cross-border projects. Unlike submarine pipelines for which some legal foundation is provided under international law by the United Nations Convention on the Law of the Sea, land based pipelines such as the TSGP depend on specific arrangements to address the particular geopolitical and economic issues inherent in these cross-border projects.161 Two models of cross-border pipeline arrangements exist, namely the connected national lines model and the international pipeline agreements model.162

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.163 The trans-national petroleum transport infrastructure is not considered as one unit, instead it has several owners/operators and is subject to a patchwork of national regulatory systems.164 Cross-border issues are regulated by contracts executed between the owners/operators of each section as well as by agreements with the respective governments.165

The second model considers the trans-boundary pipeline “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.”166 This model requires the support of each host and transit country for both the segment within their respective boundaries and for the entire system.167 It implies a blending of local and international laws.168

From the standpoint of mitigating political risk, the second model carries a major advantage over the first one. A single integrated system would help investors 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.”169 This approach is endorsed by the Energy

161 Serguei Vinogradov, Cross-Border Pipelines in International Law, 14 NAT. RES. & ENV’T 75, 75 (1999).
163 LAGONI, supra note 162, at 1034.
164 VINOGRAODOV, supra note 145, at 30.
165 Id.
166 LAGONI, supra note 162, at 1034.
167 VINOGRAODOV, supra note 145, at 31.
168 Dulaney & Merrick, supra note 162, at 248.
Charter Treaty (ECT) who’s 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{170} The ECT also provides host government and inter-governmental form agreements to achieve this purpose.\textsuperscript{171}

At the outset of structuring the TSGP, three important aspects must be contemplated for the project to be successful. The first is “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 [] free from political interference.”\textsuperscript{172} A second aspect is a sound political framework in the form of a multilateral agreement with the purpose of facilitating cross-border cooperation and to minimize the risk of cross-border disputes. The final aspect is 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{173}

\textbf{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 (1) acquisition of rights-of-way, (2) environmental considerations, (3) ownership structure, (4) taxation, (5) pipeline capacity allocation, (6) technical standards, (7) and dispute settlement.\textsuperscript{174}

\textbf{1. Right-of-Way/Right-to-Land}

Regardless of the domestic or international nature of the project, right-of-way is a major issue for all pipeline projects.\textsuperscript{175} What matters is that procedures granting this right address the need for permanent occupation and tenure over the ground traversed by the pipeline.\textsuperscript{176} With this concern in mind, the host government is expected to secure right-of-ways for the investor through adequate


\textsuperscript{173} VINOGRADOV, \textit{supra} note 145, at 20–21.

\textsuperscript{174} Id. at 21–22.

\textsuperscript{175} Id. at 22; see also Dulaney & Merrick, \textit{supra} note 162, at 259.

\textsuperscript{176} VINOGRADOV, \textit{supra} note 145, at 22.
domestic legislation. More precisely, the TSGP agreements must provide for the grant of a means to acquire the necessary land rights, along with a set of related commitments such as the time of acquisition, determination of 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.\textsuperscript{178} These commitments involve, if necessary, adoption of a special law on eminent domain providing for procedures for compulsory purchase or easements that are in the public interest.\textsuperscript{179}

2. Environmental Considerations

Environmental considerations must be addressed as early as the route selection stage, during the construction, as well as during and after the operational stage.\textsuperscript{180} At the route selection stage, the primary issue to deal with is the different lobbyists that have the potential to exert such power that even the most economic route for the pipeline may not be politically possible.\textsuperscript{181} During the construction stage, among the issues that arise are the following: 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, and risk of fire to the surrounding areas.\textsuperscript{182} To ensure that the developer complies with environmental regulations once the pipeline starts to operate, the host government may require that the developer put in place environmental bonds or guarantees. The rationale for this is to cover the cost of rehabilitating any damage caused to the environment for non-compliance with the environmental regulations or negligence.\textsuperscript{183}

3. Ownership/Corporate Structure

Different corporate and business structures may be selected depending on which producers, off-takers, and third-parties own shares or segments of the pipeline.\textsuperscript{184} In this regard, the TSGP would be a so-called “dedicated pipeline,” that is, available for use only by the owner, in contrast with multi-user pipelines where third-parties have rights of access.\textsuperscript{185} Under this approach, construction and ownership of the pipeline in its entirety are supported by petroleum producers in

\begin{itemize}
\item \textsuperscript{177} Id. at 23.
\item \textsuperscript{178} Goolsby & Rowley, supra note 169; see also Dulaney & Merrick, supra note 162, at 259.
\item \textsuperscript{179} VINOGRADOV, supra note 145, at 23.
\item \textsuperscript{180} Dulaney & Merrick, supra note 162, at 259.
\item \textsuperscript{181} Id. at 260.
\item \textsuperscript{182} Id.
\item \textsuperscript{183} Id.
\item \textsuperscript{184} VINOGRADOV, supra note 145, at 23.
\item \textsuperscript{185} Denton Wilde Sapte, Structuring Cross-border Pipelines, 47 PIPES & PIPELINES INTERNATIONAL, May-June 2002, at 11–12 (2002).
\end{itemize}
order to transport their own gas.\textsuperscript{186} As a reminder, interests contemplated for the TSGP are 45 percent each for Nigerian National Petroleum Corporation and Algeria’s Sonatrach and 10 percent for Niger, but private-sector companies might be involved as well.\textsuperscript{187}

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.\textsuperscript{188} The single entity option has some advantages over the multiple company option in that it would minimize the number of entities involved in the project, which would consequently reduce documentation, corporate formalities, and the need for interface between different entities.\textsuperscript{189} The single company option would also help simplify the operation of the pipeline since the operator(s) would be working under contracts with the same entity.\textsuperscript{190} The project company would 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.\textsuperscript{191} The last important advantage is that the single company option allows all the participants to have a common commercial interest in the entire system, and consequently to have an incentive to ensure the success of all parts of the project.\textsuperscript{192}

However, factors such as state participation and restrictions on foreign investment may command a move away from the single company model.\textsuperscript{193} 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 publicly owned entity may be able to share equity in a foreign company.\textsuperscript{194} Once those aspects have been identified, the TSGP agreements would have to address them in order to accommodate the interests of the different participants. Likewise, the TSGP agreements may have to lift possible restrictions on foreign investment. Since 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{195}

\textsuperscript{186} Vinogradov, supra note 145, at 24.
\textsuperscript{188} Denton Wilde Sapte, supra note 185, at 13.
\textsuperscript{189} Id. at 14.
\textsuperscript{190} Id.
\textsuperscript{191} Id.
\textsuperscript{192} Id.
\textsuperscript{193} Id. at 15.
\textsuperscript{194} Id.
\textsuperscript{195} Id.
4. Taxation

One of the specific issues the TSGP documentation must address is definitions of the tax regime that will apply to the project within each state to avoid double taxation and to define limit costs within a tax efficient structure. The burden of taxation may be too heavy for the commercial viability of the project without harmonization of taxes between the pipeline countries.196

The OECD Model Tax Convention has been suggested to serve as a starting point for negotiating project-specific agreements.197 The goal is to reach the “creation and maintenance of an agreed fiscal regime” among the host countries.198 Investors would prefer a tax regime that would not be altered later once the project is commenced to ensure the project’s viability will not be affected by a substantial change of law.199 To protect itself against this risk, an investor must ensure that a stabilization clause encompassing tax matters is provided in the TSGP agreements.

The several ways in which pipelines are typically 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.200 The transit fees are an essential factor to determine the commercial viability of the TSGP. They must reflect a reasonable return on the investment.201 If transit fees are deemed excessive by investors or prone to abusive changes, the fees would likely 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.202 These 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.203 With respect to the setting of the transit fees, two concepts are being used, the opportunity cost concept and the cost of service concept.204 The opportunity cost concept means that transit fees reflect what the market can bear, or if there are alternative routes, the cost of transit through such routes.205 The cost of service concept means that transit fees reflect the cost of transportation service.206

Whatever methodology is eventually selected, investors will have to ensure that the ECT restrictions are imposed on host governments. Pursuant to the ECT, contracting parties, although allowed to charge transport levies and tariffs for

196 VINOGRAĐOV, supra note 145, at 24.
197 Id. at 27.
198 Goolsby & Rowley, supra note 169.
199 Dulaney & Merrick, supra note 162, at 264.
200 Id.
201 VINOGRAĐOV, supra note 145, at 24.
202 Id.
203 Id.
204 Id. at 26.
205 Id.
206 Id.
supervision and administration of transit, are not entitled to act unreasonably and in a discriminatory manner with respect to the level of rates charged and method of application.\textsuperscript{207} The sovereign right of the host government to freely establish the level of tariff is limited to an amount that is reasonable and non-discriminatory, otherwise the host government may be brought to international arbitration by the aggrieved investor.\textsuperscript{208} So far, Algeria and Nigeria are not yet official members of the ECT, while Niger is not involved at all. Therefore, this restriction, if not set forth in the TSGP agreements, would not automatically apply.

5. Pipeline Capacity Allocation

A classic issue in cross-border pipelines is the allocation of the right to use the capacity in the pipeline.\textsuperscript{209} The usual approach is to allocate to each equity owner a right to capacity in the same proportion as its equity ownership interest. Where there is State participation, the capacity may be allocated in different proportions especially if the transit country requires an allocation of capacity to import gas for its own use.\textsuperscript{210} With respect to the TSGP, the basis for the capacity allocation must address the fact that northern Nigeria, Niger, and southern Algeria intend to use some of the gas transported for domestic consumption.\textsuperscript{211} As a result, there might not be an issue of excess capacity. But if there is, excess capacity may be offered to third parties.\textsuperscript{212}

6. Technical Standards and Norms

Although there are no official international technical standards, commonly used standards may apply to cross-border pipelines such as the TSGP.\textsuperscript{213} These standards can be employed as a basis for a uniform approach and mitigate the risk of discrepancies with domestic regulations.\textsuperscript{214} Thus, the TSGP agreements may contain a clause similar to the one contained under Article 17 of the 1976 Frigg


\textsuperscript{208} \textit{Id.} at 42–43.

\textsuperscript{209} \textit{Id.} at 12.

\textsuperscript{210} \textit{Id.} at 12–13.


\textsuperscript{212} VINOGRADOV, \textit{supra} note 145, at 90 (referring to the Caspian Pipeline Consortium excess capacity allocation).

\textsuperscript{213} \textit{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).

\textsuperscript{214} \textit{Id.}\n
Field Reservoir Agreement between Norway and the UK. Possible language for such a clause could be, “[t]he 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.”

7. Dispute Settlement

The TSGP agreements must provide the means to resolve disputes that may arise during the life of the project. Potential disputes may arise between the countries involved in the project, between the host governments and the pipeline investors, as well as between the pipeline owners/operators and the users (shippers and purchasers). 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. For foreign investors, submitting a potential dispute with the host government to an off-shore tribunal is a more preferable option than relying on a local court. If subjected to a local court, investors may have a reduced chance of prevailing because of a biased tribunal, or because a tribunal is pressured from the local government to decide a case in a certain way.

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

The major issues to be considered with respect to financing the TSGP include (1) pricing in the off-take contract, (2) cost overrun in the construction contract, and (3) the force majeure provision in the whole TSGP documentation.

1. Pricing in the Sale and Purchase Agreement

Long-term sale and purchase agreements (LSPA’s) are traditionally used in the international gas market. As in the TSGP example, sellers may spend billions of dollars processing and building transport facilities to deliver gas to a simple buyer. The LSPA’s provides the cash flow that would cover the investment. Structuring a pipeline project typically implies both LSPA’s and a gas transport agreement. In LSPA’s, the purchaser enters into a gas transport agreement with the pipeline company whereby it would commit itself to paying transport tariffs to the pipeline company. The tariffs are based on the minimum quantities of gas the

215 Id. at 27–28.
216 Id. (citation omitted).
217 Goolsby & Rowley, supra note 169.
218 Vinogradov, supra note 145, at 28.
219 Id.
220 Kenneth Hansen, A Bit of Insurance, in INTERNATIONAL POLITICAL RISK MANAGEMENT 8 (Theodore H. Moran et al. eds., 2008).
221 Gaille, supra note 36, at 646.
The purchaser has committed to take-or-pay under the LSPA with the producer. 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, meaning the purchaser will remain at liberty to instruct the pipeline company not to transport some gas but will still have to pay the transport tariff regardless.

The alternative is to have a gas transport agreement between the gas producer and the pipeline company. Under this agreement the gas producer would commit to delivering to the inlet flange of the pipeline the same quantities of gas for which the purchaser had committed to take-or-pay for under the LSPA. The gas producer will pay transport tariffs for all gas transported, and will then assign to the pipeline company all or part of the revenue stream payable by the purchaser as security for payment of the transport tariffs. Under 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 the fees in international pipelines. Practices used in the United States may be helpful in this regard. The practices are typically based on three types of methodologies: flat rates, volume incentive rates, and contract rate tariffs.

An argument that favors the feasibility of the TSGP is that the predictions about European demand for gas support the possibility of reaching the LSPA for the project. However, as discussed previously, the financial crisis and the subsequent sharp drop in gas prices may affect the pricing to the point where the TSGP may no longer be deemed financially viable. Due to the difficulty of predicting future prices, a price-reopener clause is likely an inescapable provision to be included in the LSPA. This provision would have to be carefully drafted to

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222 Stein, supra note 31, at 282.
223 Id.
224 Id. at 282–283.
225 VINOGRADOV, supra note 145, at 25.
226 Id. citing B. Nielson, Tariffs and Other Agreements Relating to Transportation on Interstate Pipelines, in 1995 OIL AND NATURAL GAS PIPELINES: WELLHEAD TO END USER 8B1, 8B (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.” VINOGRADOV, supra note 145, at 25 n.35 (citation omitted); “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.” Id. at 25 n.36 (citation omitted); “A contract rate tariff establishes 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.” Id. at 25 n.37 (citation omitted).
227 See supra part I.D.
228 See supra part II.B.
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.”

A pricing clause typically contains a normal pricing formula to recalculate the price on a regular basis. A LSPA can also provide for special price reviews, meaning it can provide the parties with a right to call for renegotiation of the price when either the buyer or the seller can demonstrate that the price is no longer appropriate in light of current market conditions.

From the standpoint of the pipeline company lender in a project finance context, it is important that the gas transport agreement provide a transport tariff with fixed escalation. Another option is 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. This choice permits the pipeline company, and consequently the lender, to avoid exposure to the volatility of energy prices.

As to the steps for determining revised price terms, if the parties cannot agree between themselves, the LSPA usually provides for a two-tiered approach. This approach consists first of appointing a single expert to settle the dispute, and then in the event one party challenges the expert’s decision, the dispute goes to an arbitral tribunal.

Since Europe would be the purchaser of the TSGP gas, specific considerations related to European regulations must also be kept in mind when drafting the LSPA. Pursuant to European competition law, destination restrictions, use restrictions, and restrictions on gas sellers are likely to affect the prevention, restriction, or distortion of competition in the E.U., which is prohibited. Therefore, these restriction provisions will not be included in the LSPA.

Balancing must also be addressed when parties want to split-stream sales or one of them wants to delay marketing of its share of gas. A balancing agreement


230 See Michael Polkinghorne, Predicting the Unpredictable: Gas Price Re-Openers, REVUE DROIT & AFFAIRES (Fr.), 2008, available at http://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.


232 Stein, supra note 31, at 283.

233 Id.

234 Polkinghorne, supra note 231, at 6.

would 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.  

2. Construction/Cost Overrun

Cost overruns are to be expected in construction of such large and complex facilities. To illustrate this, in 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 will soar from $600 million to $1 billion. The completion of this 678 kilometer (421.3 mile) pipeline, starting from the gas reserves in the Delta Niger (like the planned TSGP) and supplying Benin, Togo, and Ghana, has been delayed due to alleged vandalism. However, lack of efficiency in management may have also been an issue. 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.”  

Among the factors that have lately contributed to cost overruns, as cited by developers, are increased costs of labor, equipment, materials, permitting, weather delays, and scarcity of experienced contract workers. 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 a fixed price for the complete scope of construction work. Other options exist, such as infusion of equity by project sponsors, standby equity participants, or establishment of an escrow fund or contingency account in case of rising costs. Also, management experience and permitting, which are both recurrent reasons put forward to explain cost increases, should be addressed in the TSGP agreements. In


237 “Amount by which the actual cost exceeds the budgeted, estimated, original, or target cost,” *Definition of Cost Overrun,* BUSINESS DICTIONARY, http://www.businessdictionary.com/definition/cost-overrun.html (last visited Nov. 27, 2010).


240 Id.

241 HOFFMANN, supra note 32, at 166.


243 HOFFMANN, supra note 32, at 171.

244 Id. at 166.
addition to the elements above, a lender will expect a comprehensive insurance program covering all insurable risks during construction.\textsuperscript{245}

3. Force Majeure

In the energy sector, issues related to a 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.”\textsuperscript{246} The relief available under a force majeure provision first depends in large part upon the precise words used and the specific events listed.\textsuperscript{247} 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 a major threat to the TSGP.\textsuperscript{248} Accordingly, drafters of the project contracts must ensure that acts of sabotage are included in the force majeure provision. Weather-related events deserve the same close attention, especially for the sections that cross the Sahara desert. The relief available should also depend upon the consistency of the force majeure provisions among the project contracts.\textsuperscript{249} Parties “need to consider their exposure to force majeure events not just [as] a single contract, but in their contracts as a whole.”\textsuperscript{250} 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.\textsuperscript{251} Different options exist to greatly reduce 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.\textsuperscript{252} Alternate solutions are standby credit, dedication of reserve funds, and employment of additional labor.\textsuperscript{253} Methods to mitigate other events, such as a 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), which usually protects against currency inconvertibility, but not against

\textsuperscript{245} Stein, \textit{supra} note 31, at 281.
\textsuperscript{247} \textit{Id.} at 98.
\textsuperscript{248} LOWE ET AL., \textit{supra} note 33, at 1044.
\textsuperscript{249} HOFFMANN, \textit{supra} note 32, at 118.
\textsuperscript{250} Kelley, \textit{supra} note 247, at 117.
\textsuperscript{251} \textit{Id.}
\textsuperscript{252} \textit{Id.}
\textsuperscript{253} \textit{Id.} at 119.
currency devaluation. This risk is more acute in projects involving intensive hard currency, denominated financing, and high volumes of income in local currency, which probably would not be the case of the TSGP where the gas would be sold primarily to European consumers. 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 arbitration default awards or expropriation coverage. To trigger PRI protection, however, the prerequisite is that the State refuses to abide by the international arbitration award. That is why, as previously contemplated, the dispute settlement aspect is critical in the TSGP project.

Although the possibility of expropriation in Niger has been noted, it is civil unrest that seems to be the major threat to the TSGP throughout its route. For the investor, it is imperative to seek explicit protection against this risk. Indeed, 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 host state is not obliged to compensate for damage caused by non-governmental actors such as rioters, rebels, or looters. This risk can nevertheless be addressed with PRI or investment treaties requiring that host states provide full protection and security to investors and their assets. As previously pointed out, another way to mitigate the risk of political violence, at least in Nigeria and Niger, would be local equity participation in order to alleviate regional discontent. Or, similarly to mimic what has been done in the case of the Chad-Cameroon pipeline, 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 pronounced 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 effort. The Chad RMP involved delicate matters of sovereignty infringement and, despite Chad’s unilateral governmental action, some of the RMP structure is still in place. But the contemplation of a RMP in the case of the TSGP implies the participation of the World Bank, and the chances of

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255 Id. at 81.
256 Id.
257 See supra part III.C.vii.
259 Id. at 20.
260 See supra part II.A.
262 Id. at 292.
263 Id.
bringing it into the project are likely very weak since, unlike Chad and Cameroon, Nigeria and Algeria are two relatively wealthy countries. If a sort of RMP proves to be out of reach, compliance with the Extractive Industries Transparency Initiative (EITI) standards must at the very least be accepted by the TSGP countries. From the perspective of sharing revenues with regional governments, applying the EITI principles may serve as a central “government’s commitment to good governance, increasing revenue collection, and improving [the] country’s investment climate.”

CONCLUSION

Even if the TSGP is not technically particularly challenging, due to the significant threats surrounding the project, the feasibility and the success of this particular venture will first depend upon the willingness of the countries involved to establish a clear, stable, and predictable legal framework, addressing as comprehensively as possible the issues inherent in cross-border pipelines. To the extent the TSGP countries seek external partners, namely sponsors and financiers, they will have to provide sound guarantees, involving the surrendering of some sovereignty as evidence of their commitment to minimize the substantial political risk carried by the TSGP project. Otherwise, the interest shown by the international oil companies will remain purely political and strategic, nothing more than a way to flatter host governments in exchange for access to the petroleum and gas fields. If this is the case, the TSGP project will remain undeveloped.

\[264\] Duruigbo, supra note 62, at 422.
\[265\] THE WORLD BANK, IMPLEMENTING THE EXTRACTIVE INDUSTRIES TRANSPARENCY INITIATIVE: APPLYING EARLY LESSONS FROM THE FIELD 2 (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.”).
\[266\] Id. at 1.
APPENDIX 1 – CHECKLIST OF THE MAIN ISSUES TO ADDRESS IN THE TSGP AGREEMENT

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 mechanisms (if party to ECT) and international arbitration procedures.

Other issues to be addressed in this documentation include:

- Ownership (private versus state, transit state ownership versus 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;
- An agency for oversight, planning, construction, and initial operation;
- Safety, environmental, technical construction and operation standards;
- Routing;
- Access and scheduling mechanisms;
- Interruptions and emergencies;
- Telecommunications;
- Abandonment;
- Disposal of interest.

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268 VINOGRAODOV, supra note 145, at 100–101 (citation omitted).
APPENDIX 2 – CHARACTERISTICS AND CONSEQUENCES OF CROSS-BORDER OIL AND GAS PIPELINES

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

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>CONSEQUENCES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transit</strong></td>
<td>Involves governments</td>
</tr>
<tr>
<td>Requires transit agreement</td>
<td>Increases the number of players</td>
</tr>
<tr>
<td>May involve competing for markets</td>
<td>Transit governments have different objectives</td>
</tr>
<tr>
<td>May involve competing for volumes</td>
<td>Transit revenues are a zero sum game</td>
</tr>
<tr>
<td><strong>Cross-Border</strong></td>
<td>Different legal and regulatory regimes apply</td>
</tr>
<tr>
<td>Need contacts governed by different legal regimes</td>
<td>Differing energy markets are involved (regulation, structure, degree of competition)</td>
</tr>
<tr>
<td>Need to move between differing legal and regulatory environments</td>
<td>Imports may compete with a national project</td>
</tr>
<tr>
<td></td>
<td>Benefits must be shared across the border</td>
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<tr>
<td><strong>Pipelines</strong></td>
<td>The “bygones rule” operates</td>
</tr>
<tr>
<td>Subject to economies of scale</td>
<td>Full-capacity operation is the key to profitability</td>
</tr>
<tr>
<td>High fixed costs</td>
<td>Requires regulation</td>
</tr>
<tr>
<td>Potential for natural monopoly</td>
<td>Limited flexibility</td>
</tr>
<tr>
<td>Changing capacity is difficult once built</td>
<td></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>
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<tr>
<td>History of state involvement</td>
<td>Regulation exists</td>
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<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>
</tr>
<tr>
<td></td>
<td>Regulation requires</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>
<td></td>
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</tbody>
</table>

269 ESMAP, supra note 8, at 11–12.