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Through the Fire: Independent Power Projects and Power Sector Reform in Côte d'Ivoire

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Acronyms

ABB	Asea Brown Boveri
AFD	Agence Française de Développement
AfDB	African Development Bank
AKFED	Aga Khan Fund for Economic Development
ANARE	Autorité Nationale de Régulation d'Electricité
BOAD	Banque Ouest Africaine de Développement
BOOT	Build-Own-Operate-Transfer
CDC	Commonwealth Development Corporation
CFD	Caisse Française de Développement
CIE	Compagnie Ivoirienne d'Electricité
CIPREL	Compagnie Ivoirienne de Production d'Electricité
CNR	Canadian Natural Resources
COD	Commercial Operating Date
DEG	Deutsche Investitions- und Entwicklungsgesellschaft, German Investment Development Company
€	Euro
EDF	Electricité de France
EECI	Energie Electrique de Côte d'Ivoire
EIA	Energy Information Administration
EPC	Engineering Procurement Contractor
ESI	Electricity Supply Industry
FCFA	Franc Communauté Financière Africaine
FMO	De Nederlandse Financierings-Maatschappij voor Ontwikkelingslanden, Netherlands Development Finance Company
GE	General Electric
GSB	Graduate School of Business
GSPER	Groupement Spécial Pour l'Electrification Rurale
GWh	Gigawatt hour
ICB	International Competitive Bid
IDA	International Development Assistance
IMF	International Monetary Fund
IPP	Independent Power Project
IPS	Industrial Promotion Services
kV	kilovolt
kWh	kilowatt hour
MIR	Management Programme in Infrastructure Reform and Regulation
MW	Megawatt
O&M	Operation and Maintenance
OECD	Organisation for Economic Co-operation and Development
PRG	Partial Risk Guarantee
PROPARCO	Promotion et Participation pour la Coopération économique
SAUR	Société d'Aménagement Urbain et Rural
SODECI	Société de Distribution d'Eau de Côte d'Ivoire
SOGEPE	Société de Gestion du Patrimoine du Secteur de l'Electricité
SOPIE	Société d'Opération Ivoirienne d'Electricité
UEMOA	Union Economique et Monétaire Ouest Africaine
UNDP	United Nations Development Programme
US$	United States Dollar
VAT	Value Added Tax

WAGP	West African Gas Pipeline

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Abstract

This paper documents the experience of independent power projects (IPP) in Côte d'Ivoire. In the years corresponding with IPP development and operation, the power sector has virtually been through the fire. Severe droughts, a significant currency devaluation immediately pre-IPPs, political unrest, and suspension of a large part of revenue from power sales for an extended period has impacted on the sector's performance. Still, interest in the country's power sector has not been quelled, with both the IPPs keen to expand their interest in the generation sector. This study explores how a number of factors have contributed to the IPPs' performance. Coherent power sector planning after the droughts of the 1980s has resulted in the country not only having a more optimal mix of hydro and thermal power sources, but enough power to supply itself and export to its neighbours. A stable currency, pegged to the Euro, means that revenue assurances in terms of exchange rate risks are more robust than what is typical of most Sub-Saharan African IPPs. Containing the political instability to the north of the country where there are relatively fewer consumers than in the south has aided the utility to keep head above water when revenues stopped flowing in from rebel controlled areas. In addition, the presence of domestic gas has helped keep power prices down relative to countries that have no domestic fuel resources.

1. Introduction

The Republic of Côte d'Ivoire is one of the pioneers in Sub-Saharan Africa in terms of private participation in the power sector. Since 1990, the country's electric utility has been managed by a private operator. As of 2006, independent power producers accounted for nearly two thirds of national electricity production. The Government of Côte d'Ivoire is also in the process of finalising an agreement for a third privately contracted power plant, and construction is set to start in 2008. Meanwhile, the country has experienced severe droughts, a significant currency devaluation immediately pre-IPPs, political unrest, and suspension of a large part of revenue from power sales for an extended period.

This paper examines Cote d'Ivoire's electricity supply industry and the contribution of the country's two independent power producers.[1] The main objective of the paper is to explore the investment and development outcomes of the projects for investors and the host country, respectively. Put differently, to what extent did the investor benefit from the investment, and to what extent were the expectations of the host country realised? A number of factors are considered in having influenced outcomes, including drought, currency devaluation, civil unrest, the role of the regulator and the impact of the management contract.

The Ivorian paper is structured into three parts. The first gives an overview of the electricity supply industry, the main stakeholders, and the reforms that have taken place to date. The second section details the independent power projects that have supplied power to the national grid since reform started in the sector. In the third section, an analysis of the elements that have contributed to the outcomes of the projects is presented. In performing the research, the authors adopted an inductive research approach, which involved conducting structured literature searches, followed by a country visit and detailed interviews with key stakeholders.[2] The result of these efforts is the present study. Any errors and omissions are the responsibility of the authors.

2. The Ivorian Electricity Supply Industry

The country's ventures into private participation may be attributed to a host of factors including its economic conditions, drought, and its long relationship with the International Monetary Fund (IMF) and the World Bank. Legislation allowing private participation in the power sector was enacted more than twenty years ago and the country has had two series of organisational reforms in support of sectoral reforms (first in 1990 and then again in 1998), which will be probed in this section. [3]

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[1] This paper is part of a research programme on IPPs in Africa led by the Management Programme in Infrastructure Reform and Regulation (MIR), based at the University of Cape Town's Graduate School of Business (GSB). Case studies documenting the IPP experiences of Egypt, Kenya, Morocco, Tanzania and Tunisia are available along with an Africa-wide survey via www.gsb.uct.ac.za/mir.

[2] Interviews and written queries were conducted with nine stakeholders throughout 2007 in Côte d'Ivoire. Interviews were followed by email correspondence to clarify discussion points. Stakeholder interviews included representatives from the Ministry of Energy, the Compagnie Ivoirienne d'Electricité, Compagnie Ivoirienne de Production d'Electricité, Azito Energie and l'Autorité Nationale de Régulation.

[3] Law no.85-583 of 29 July 1985 was created to allow private participation in the generation sector (Simon, 2006).

From as early as 1952 and until 1990, the state owned utility, Energie Electrique de Côte d'Ivoire (EECI), exercised a monopoly over the generation, transmission and distribution in the country.[4] Persistent poor performance, which started as far back as the early 1980s, finally brought an end to this monopoly organization. By 1990, the EECI's debt totalled about US$350m and the utility had started to default on its debt payments; its billing rate was under 85 per cent, and the billing recovery rate stood at 70 per cent (ANARE, 2005). The World Bank's Staff Appraisal Report (1995:5) states that in 1990, the EECI was insolvent with losses totalling more than US$240m. The causes were multi-fold, including: the country's economic crises,[5] overexpansion and mismanagement in the electricity sector, and finally severe droughts (between 1983 and 1985) and associated low sales due to drought as well as the acquisition of four emergency turbines.

With no domestic reserves to spare, the country turned to the World Bank and the IMF for assistance. On the Bank's recommendation, it was decided that Cote d'Ivoire would engage private sector participation and reform and restructure its electricity industry.[6] Eager to replicate the success that had been seen in the country's water sector, the government invited Société d'Aménagement Urbain et Rural (SAUR - who was involved in a management contract in the water sector) and Electricité de France (EDF) to participate.[7] On October 20th 1990, after six months of negotiations with Bouygues, an agreement was signed with SAUR and EDF to take over the management of the utility for a period of 15 years, with the contract renewable twice for three years (Ahoussou, 2005).[8] Compagnie Ivoirienne d'Electricité (CIE) was formed with SAUR and EDF assuming 51 per cent of the shares to have controlling rights in the company (Fall, n.d.). The remaining 49 per cent was retained by Ivorian (public) interest (Vei, 1999). The management company operates the assets for a fee but contractually has no obligation to invest capital in the sector – the responsibility of continued investment remains with the state. With the introduction of a private operator for the utility, the role of the EECI was reduced to oversee the technical

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[4] Prior to the 1950s, certain municipalities were responsible for electrical generation and distribution (Lavigne, 1999).

[5] At the time, cocoa and other export commodity prices dropped sharply, and the country's debt situation made it difficult for the state to aid the utility financially.

[6] These recommendations were part of an informal policy espoused by numerous World Bank staff (as well as many others across both developing and industrialized regions), but never officially adopted by the Bank, which came to be known as the standard model for power sector reform. This model has been roughly defined as a series of steps that move vertically-integrated utilities toward competition, and generally include the following activities, in the following order: corporatization, commercialization, the passage of the requisite energy legislation, the establishment of an independent regulator, the introduction of IPPs, restructuring/unbundling, divestiture of generation and distribution assets and the introduction of competition (Bacon 1999:4; Adamantiades, Besant-Jones et al. 1995:6-7; Besant-Jones 2006:11; Williams and Ghanadan 2006:822). Important to note that although this model, which was based largely on the early power sector reforms carried out in the England and Wales, Chile and Norway, came to represent a standard, it is arguable that not all the steps were relevant to the conditions on the ground in most developing countries. Finally, although never official Bank policy, many World Bank loans were conditioned on power sector reform (the standard model) starting in the 1990s.

[7] From as early as 1974, Côte d'Ivoire has known private participation in its infrastructure industries when the state owned water company, Société de Distribution d'Eau de Côte d'Ivoire (SODECI) signed a 15-year management contract with the Government of Côte d'Ivoire (Lavigne, 1999).

[8] A new contract was signed between the Government of Côte d'Ivoire and CIE for another 15 years, on October 12, 2005 (CIE Annual Report, 2005).

operations of the CIE and implement the country's rural electrification programme (CIE 2007, pers. comm., 27 March).

Although the private companies brought in the necessary funds to get the utility running again, the threat of weather conditions and inadequate supply remained, with the utility operating just one thermal plant at the time (as discussed in section 2.2). In keeping with the overall reform and restructuring goal first espoused in 1990, the government turned to Bouygues, in 1994, and negotiated Côte d'Ivoire's and Sub-Saharan Africa's first independent power project, Compagnie Ivoirienne de Production d'Electricité (CIPREL). Less than two years after the plant was commissioned, the government contracted a second IPP, Azito, to satisfy the country's electricity demand that was fuelled by bullish economic growth.[9]

In 1998, the state created the present day structure and entities to provide oversight and regulate the management of the sector and improve the technical and financial performance (Diaz and Perrault, 2002). More specifically, EECI was dissolved in December 1998, and three new state institutions were created:

- Société de Gestion du Patrimoine du Secteur de l'Electricité (SOGEPE) was set up to manage the finances of the sector on behalf of the state;[10]
- Société d'Opération Ivoirienne d'Electricité (SOPIE) was established to ensure long-term planning of the sector for future electricity capacity and the requisite fuel requirements;
- Autorité Nationale de Régulation (ANARE) was formed as a regulator to the sector (Lavigne, 1999).

Although established in 1998, ANARE only became operational in 2000, after the two IPPs were negotiated. Since its formation, the regulator acts as an arbiter between CIE and customers and is in charge of resolving disputes between stakeholders in the sector, including the IPPs. ANARE also advises the state, but it has no tariff setting powers or mandate. Despite a desire from staff to see the organization move toward greater independence and authority, especially with regard to tariff setting, ANARE's role remains largely that of advisor to the Ministry of Mines and Energy (ANARE 2007, pers. comm., 29 March).

2.1. Tariffs

Tariffs are set by the state, primarily via the Ministry of Mines and Energy, taking into account an array of factors such as the financial viability of the utility, debt service obligations and consumer affordability. As of 2007, tariffs are considered low and ultimately not cost reflective; while operating costs of the utility are covered, revenue from tariffs does not cover the cost of additional investment in infrastructure.

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[9] In December 1999, however, the country experienced a coup, after which economic decline, political unrest and instability, followed. It is only since 2004 that Cote d'Ivoire has seen positive economic growth, and the government is in the process of negotiating the country's third thermal IPP (2007), as described further in section 2.2.1.

[10] SOGEPE oversees the finances of the sector and pays suppliers in the following order: CIE; IPPs and gas suppliers; government stakeholders; major maintenance and refurbishment projects; debt; capacity expansion provisions; rural electrification (Simon, 2006).

Electricity tariffs in Côte d'Ivoire were increased in 2001 (ANARE 2007, pers. comm., 29 March, CIE 2007, pers. comm., 27 March) when the sector saw a cumulative deficit due in part to a tariff that was not cost reflective and arrears of payments by Ghana's Volta River Authority (AfDB/OECD, 2003).[11] Since the 2001 tariff adjustment, however, there has been no further action taken, including to reflect the fact that fuel prices have almost quadrupled.[12] Finally, it should be noted that the government subsidizes consumption for all residential customers (regardless of income) up to 80 kWh over two months, which amounts to a rate of roughly 35FCFA/kWh (AfDB/OECD, 2004).[13]

In addition to the relatively low tariffs, since the period of civil unrest, which started in September 2002, roughly 15 per cent of the utility's revenue has not been forthcoming; customers residing in the northern area, controlled by the rebels, have ceased paying their bills. This has resulted in large losses for the utility and edged the electricity sector's finances into the red for the first time since privatisation (AfDB/OECD, 2004). Following, the ceasefire peace agreement (signed in early 2007), money is slowly starting to trickle in again. However, a significant turnaround in the situation is only expected after a prolonged period of political stability (Ministry of Mines and Energy 2007, pers. comm., 28 March).

Needless to say Cote d'Ivoire has benefited from its neighbours' electricity demand. During this time of revenue loss and stagnant growth in domestic demand, greater amounts of energy were available for export, with payment made in hard currency for power. In 2005, exports totalled 1397GWh (Ministry of Mines and Energy 2007, pers. comm., 28 March). This nearly equals the guaranteed capacity of CIPREL, which is at 1410GWh per year.

2.2. Generation

The generation mix has changed considerably over the past four decades. After the country's independence, plans were put in place to develop Côte d'Ivoire's hydro potential, but during the 1970s most of the growth was attributed to diesel plants that were commissioned. It was not until the 1980s that hydropower took over as the dominant source (albeit briefly) of electricity in Côte d'Ivoire. Since then, growth has been, once again, mostly thermal (as depicted in Figure 1).

[11] The tariff basket was reorganised to make tariffs more socially acceptable after the 1999 coup d'etat, which involved a 10 per cent weighted increase (ANARE personnel 2007, pers. comm., 29 March).

[12] The price of gas is normally indexed to the price of crude oil and is paid for in foreign currency. In 2001, the average price of crude oil was at US$23 a barrel. In January 2008 it is at more than US$80 a barrel.

[13] 1€ = 656 CFA francs.

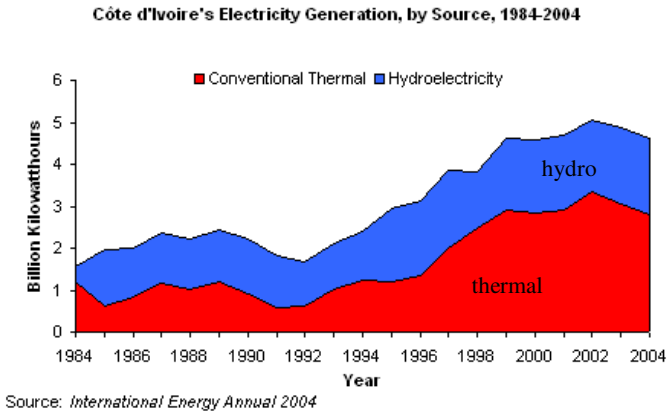

Figure 1: Evolution of Electricity Generation by Fuel in Côte d'Ivoire.

Following the droughts in 1983 and 1984, a plan was formulated to complement hydro with thermal capacity with a long-term view to have a 50/50 split between thermal and hydro generation. Vridi I was the first thermal plant installed by the state in 1984. EECI ordered four 25MW emergency gas turbines from General Electric to make up for the shortfall in electricity supply (CIE 2007, pers. comm., 27 March), which although providing drought-relief, also contributed to the utility's financial woes, as noted previously in section 2. Vridi I was followed by CIPREL and Azito, which seriously augmented the state's thermal resources.

In 2006, hydropower accounted for 27 per cent of generation, the rest being made up from thermal sources. CIPREL and Azito, the IPPs accounted for 27 per cent and 39 per cent of generation respectively, with the balance contributed by Vridi I (Ministry of Mines and Energy, 2007). IPPs therefore account for approximately two thirds of national production. Table 1 gives a breakdown of the installed capacity in Côte d'Ivoire as of 2007.

Table 1: Installed Electricity capacity in Côte d'Ivoire

Plant	Year	Installed Capacity	Type
Ayame I	1959	20	Hydro
Ayame II	1965	30	Hydro
Kossou	1972	174	Hydro
Taabo	1979	210	Hydro
Buyo	1980	165	Hydro
Fayé	1983	5	Hydro
Vridi I	1984	88	Thermal
CIPREl IPP	1995	210	Thermal
Azito IPP	2000	300	Thermal

Source: Ministry of Mines and Energy (2007)

2.2.1. Future Plants

Despite the recent push for thermal, hydro remains an important actual and potential source for electricity production in Cote d'Ivoire. The state is presently planning a new hydro plant, Soubré, with a nominal capacity of 300-350MW, which is expected to be bid out to the private sector and be the country's first hydro IPP. This project has, however, met with considerable delays due to the civil conflict and is now slated to be operational only in 2014 provided negotiations are

successful (International Water Power, 2006; Ministry of Mines and Energy 2007, pers. comm., 28 March).

Meanwhile, the state has engaged both IPPs in negotiations for additional generation. CIPREL has already started the conceptual development of the next phases of thermal capacity, hopeful of receiving the green light from the government. Should the company be given the go-ahead to develop the next tranche of thermal capacity, it will consist of another 110MW open cycle gas turbine by General Electric, which would constitute the third phase of the project (with phases one and two detailed in section 3.1). A fourth phase is planned where exhaust gases from the two existing 110MW turbines will be combined to be used in a steam cycle, adding another 110MW to the plant's output. If this is realised, CIPREL would be among the largest gas-fired IPPs in West Africa with an output of 540MW.

2.3. Fuel

It is estimated that Cote d'Ivoire's proven gas reserves (at 1.1 billion cubic feet) are sufficient to fire the existing plants for the next 22 years; both IPPs use natural gas as the primary energy for power production, along with Vridi I, and presently the electricity supply industry (ESI) constitutes about 97 per cent of the national gas demand (ANARE 2007, pers. comm., 29 March). The plan for new plants, including those noted above, however, reduces the proven reserve life to approximately 10 years (AfDB/OECD, 2004; Ministry of Mines and Energy 2007, pers. comm., 28 March). Thus, either significant growth in the country's gas exploration is needed or another alternative must be identified to fuel the growing fleet.

It is envisaged that the West African Gas Pipeline (WAGP), which will distribute Nigerian gas to Ghana, Benin and Togo, may eventually be extended to other coastal West African countries, including Cote d'Ivoire. Such an extension of the WAGP could help relieve the state of its obligations to ensure that domestic gas fields are continually exploited for primary energy, especially with regard to IPPs, for which it (the state) assumes the fuel risk.

In the meantime, that is, until such time that WAGP provides a viable alternative, domestic exploration efforts continue. Ongoing since the 1950s, discoveries were limited until the 1970s when large reserves of both oil and gas were found off-shore. Since 1990, with World Bank assistance, as well the African Development Bank and the Japanese government, the government has sustained interest in the country's hydrocarbon sector with exploration incentives and promotion campaigns (World Bank, 1995:3).

The domestic gas industry, which to date has been critical in containing electricity prices by avoiding more costly imports, is made up of three suppliers: Devon, Canadian Natural Resources (CNR) and Foxtrot (which carries Bouygues and EDF interest), which will be discussed in greater detail in section 4.2.1.[14] All three firms contract directly with the state, which, as noted above, manages fuel contracts for all plants, including the IPPs.

[14] Devon operates two offshore gas fields, viz. Lion and Panthere in Jacqueville, Foxtrot International operates the Foxtrot gas field (the largest gas field Côte d'Ivoire) in the same zone, and CNR operates the Espoir field west of Abidjan (CIPREL, 2006). The Espoir field operated by CNR provides both oil and gas whereas the fields developed by Foxtrot and Devon provide only gas (ANARE personnel 2007, pers. comm., 29 March). Devon was formerly known as Ocean Energy and Foxtrot was known as Apache.

2.4. Transmission and Distribution

Although the WAGP is still in the development stage, Cote d'Ivoire is already well connected to its immediate neighbours in terms of electricity.[15] As mentioned previously (section 2.1), in the context of coping with a stagnant domestic market between 1999 and 2004, the state has benefited from these connections by exporting power to Ghana, Togo, Benin, Mali and Burkina Faso (Ahoussou, 2005). In fact, Cote d'Ivoire has gone from a net importer of power in the 1980s and early 1990s to currently being the main electricity exporter in the region. In 2005, more than a quarter of the national production was exported to the country's neighbors, and it is the government's policy to maintain the country's status as a power provider to the region (Ministry of Mines and Energy, 2006).

Apart from regional exchanges, roughly 72 per cent of villages in the country have access to electricity, however, due to low penetration rates this equates to only 30 per cent of the total population having access (Ministry of Mines and Energy 2007, pers. comm., 28 March). Although rural electrification plans were initiated in the early 1980s, serious difficulties experienced in the management of the sector, the economic crisis of the 1980s and the severe droughts forced the suspension of these programmes for several years (Diaz and Perrault, 2002). The rural electrification programmes resumed again only in 1991, gaining momentum when a Special Group for Rural Electrification, GSPER (Groupement Spécial Pour l'Electrification Rurale) was formed in March 1995. After the 1998 restructuring, SOPIE was mandated to oversee the implementation of the rural electrification programme as part of its mandate of electric network planning, as first introduced in section 2 (Vanie, 2000).

3. Independent Power Producers

How have IPPs developed amidst this context and what has been their experience and impact to date? Already described was the utility's precarious financial situation that gave impetus to reform and restructuring, and which, together with the droughts, prompted diversification of fuel and technology sources. Strong ties to multilateral and bilateral lenders that were keen to try a private sector alternative also influenced Cote d'Ivoire's decision to go the IPP route. Finally, the immediate experience of the water sector and the presence of competent private sector parties, such as SAUR and EDF, made for an easy turn to Sub-Saharan Africa's first IPP.

3.1. Compagnie Ivoirienne de Production d'Electricité (CIPREL)

Formed in 1994, CIPREL started out with the following shareholding: 88 per cent was owned by SAUR International through Valener, a company set up to manage the shares of SAUR (65 per cent) and EDF (35 per cent) (CIPREL 2007, pers. comm., 29 March). The remaining 12 per cent was held by Agence Française de Développement (AFD)[16] through its subsidiary Promotion et Participation pour la Coopération économique (PROPARCO), as well as the International Finance Corporation (IFC) and the Banque Ouest Africaine de Développement (BOAD). Although a selective tender process was administered by EDF and SAUR, it should be noted that the substation and transmission system expansion as well as Phase II of CIPREL were procured through an ICB (World Bank, 1995:17).

[15] The country operates a transmission system at the 225kV and 90kV level (Vei, 1999).

[16] Formerly Caisse Française de Développement (CFD).

In 2005, the smaller equity partners (AFD/PROPARCO and IFC) sold their shares along with EDF, and a holding company, Fina Gestion, was created to oversee the equity in CIPREL (CIPREL 2007, pers. comm., 29 March).[17] At the same time in 2005, SAUR International was dissolved. The shares in Fina Gestion are now entirely held by the parent company, SAUR Group. Currently, CIPREL's shareholders are Fina Gestion (98 per cent) and BOAD.[18]

The plant comprises four open cycle gas turbines with a combined capacity of 210MW. Three of the gas turbines have a capacity of 33MW each and were commissioned in March 1995.[19] The fourth gas turbine has a capacity of 111MW and was commissioned in June 1997 (CIPREL, 2006). The plant runs on natural gas, which may be provided by one of three gas suppliers (detailed in section 2.3), and as a backup, may also run on heavy vacuum oil (HVO) or distillate diesel oil (DDO). The plant initially used liquid fuel when it was first commissioned until the gas infrastructure was developed in November 1995 (CIPREL personnel 2007, pers. comm., 29 March).

General Electric (GE) is the Original Equipment Manufacturer (OEM) of the four turbines and the company uses GE, Alstom and other OEMs for specialised maintenance. More general maintenance is normally subcontracted to local Ivorian companies, viz. Friedlander, Pictor and even CIE (CIPREL, 2006). The plant's availability since commercial operation date (COD) has been approximately 95 per cent (CIPREL 2007, pers. comm., 29 March).

3.1.1. Project Financing and Incentives

CIPREL was initially built in two phases (with two subsequent phases now in the making). The debt equity ratio at the end of the first phase was 75:25, with debt arranged by IFC and BOAD. By the end of the second phase, the ratio moved to 86:14. For the second phase, the World Bank extended an IDA low-interest loan to the government of Côte d'Ivoire which in turn lent it to CIPREL (CIPREL 2007, pers. comm., 29 March). The on-lending duration term of 17 years means that the maturity of the US$50m loan coincides with end of the concession term. The agreement also contains a five year grace period as a contingency to allow for the debt service payment of CIPREL's first phase, which had an amortization period of 10 years (World Bank, 1995:16). As an extra security cushion for the lenders to CIPREL, a six month equivalent of debt service payments were to be held in an off-shore escrow facility (World Bank, 1995).

The project was exempt from all taxes and import duties on equipment. In addition, a tax holiday was granted to CIPREL over a five year phase-out period (World Bank, 1995). By year-six, CIPREL was expected to pay the full tax at the company rate (of 27 per cent). Apart from VAT exemptions on plant equipment there have been no other investment incentives on the project.

3.1.2. The Power Purchase Agreement

[17] Although offloading the shareholding position, EDF is still involved in CIPREL in a technical capacity.

[18] Established in November 1973 and headquartered in Lomé, Togo, BOAD is a development finance institution of the Union Economique et Monétaire Ouest Africaine, UEMOA.

[19] The plant was officially inaugurated on April 27th 1995.

The PPA is rather simple in that it is not linked to a minimum availability as has been the custom in other African IPPs (see, for example, Morocco, Tunisia, Ghana, etc). The arrangement comprises a take-or-pay contract for 1410GWh of power every year (CIPREL, 2006). In accordance with the agreement, CIPREL is obliged to supply a minimum of 1410GWh a year, but may be asked by the state to increase this amount to 1460GWh a year. Payment of the additional power is invoiced at 8 per cent of its nominal value for the first 48GWh and 38 per cent for any power over and above the additional 48GWh (CIPREL 2007, pers. comm., 29 March). The contract duration is 19 years and transfer is expected in August 2013 in accordance with the Build Own Operate Transfer (BOOT) agreement.

After ten years of operation, the state has the right to buy back CIPREL (World Bank, 1995). Compensation for the assets, the foregone dividends and the take-over of the remaining debt would be included in a negotiated agreement, were the state to exercise this option.
Despite CIE being the physical off-taker of the actual power generated, the contractual agreements are between the Government of Côte d'Ivoire and CIPREL for purchased power. Hence, as far as CIPREL is concerned, it is the government that is the customer in terms of financial and contractual matters.[20]

3.2. Azito Independent Power Producer

Unlike the country's first IPP, Azito was initiated under an international competitive bid launched in October 1996. This occurred at a time when growth in electricity demand was more than 7 per cent per annum. In June 1997, after the bid adjudication process was completed, Azito was awarded to a consortium of five firms (Nandjee, 2006). The plant consists of two 147MW gas turbines operated in an open cycle mode. At the project's inception it was planned that the plant would include a combined cycle unit composed of two heat recovery boilers and a steam turbine with a condenser. To date, however, the steam cycle has not yet been realised.[21] Project agreements were signed by July 1998 and construction started immediately although the final financial closure occurred only in January 1999 (Project and Finance Guarantees, 1999). Commercial operations started in February 2000 for this BOOT plant.

3.2.1. Project Stakeholders and Financing

The winning consortium of the bid consisted of Cinergy (a holding company comprising ABB and EDF), Industrial Promotion Services West Africa (IPS) and the Commonwealth Development Corporation (CDC). Initially CDC was a lender to the project with a debt-to-equity swap option, which was exercised in 2002 (Azito 2007, pers. comm., 27 March). The shareholding is as follows:

- Cinergy Holding Company[22] (EDF and ABB) 65.7%

[20] CIE is merely a company under a management contract to distribute power and collect revenues and hence is not in a position to undertake any contractual commitments on its balance sheet.

[21] Since the coup in December 1999, discussions on the completion of the steam phase of Azito were suspended.

[22] Although EDF and Alstom (one of the three short listed consortia) lost the bid, they were still included in the final shareholding after high level political negotiations (Azito pers.comm., 2007).

- Azito Energie Holding (Aga Khan and IPS West Africa)[23] 23.1%
- CDC Globeleq[24] 11.2%

The US$45m equity invested by the shareholders represented approximately 20 per cent of the total project cost, which amounted to US$223m for the plant and associated transmission infrastructure.[25] ABB was the EPC contractor to the project and EDF and ABB the operator of the plant.

The lenders to the project were as follows:

Senior Debt

- IFC A loan[26] US$32m 14 years maturity
- IFC B loan US$30m 10 years maturity
- Commercial Banks US$30m 12 years maturity
- CDC Club US$48m 12 years maturity

Subordinated debt

- IFC Fixed US$4m
- IFC Convertible US$4m
- CDC Club US$6m
- CDC Fixed US$6m

A number of bilateral and multilateral institutions funded the CDC Club senior debt including the African Development Bank, the Netherlands Development Finance Company (FMO) and the German Investment and Development Company (DEG). In addition to the equity and debt funding, US$18m from operations (after the first gas turbine was commissioned) went towards financing the project.

The US$30m in loans from commercial banks were underwritten by an IDA Partial Risk Guarantee (PRG) and syndicated by Société Générale of France (Gaba, 2001).[27] The PRG

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[23] Active in Côte d'Ivoire for over 30 years, IPS West Africa's investment in Azito was, however, its first in the country's power sector (Aga Khan Development Network, n.d.; Azito 2007, pers. comm., 27 March). Furthermore, although owned by Aga Khan Fund for Economic Development (AKFED), IPS West Africa and AKFED each hold separate shares in the Ivorian Azito Energie Holding Company, 69 per cent and 31 per cent, respectively, with the Holding Company in turn being a 23 per cent shareholder in Azito (Azito Power Plant, 2004).

[24] Most of CDC's equity shares in projects were replaced by Globeleq, which was spun off of the CDC Group in 2002 and was established to invest in power projects in Africa, the Americas and Asia. It should, however, be noted here that Globeleq remains entirely owned by CDC.

[25] The shareholders also committed US$17m to the project as a contingency (Project Finance and Guarantees, 1999).

[26] IFC A loan refers to IFC's own account, whereas IFC B loan refers to an IFC syndicated loan.

[27] When the government extended the scope of the financing to include the transmission infrastructure and requested the sponsors to finance the additional cost, IDA was brought on board. Azito was the first power project in Sub-Saharan Africa to borrow privately from a syndicate of commercial banks (World Bank, 2003:29).

payment obligations include capacity and termination payments for: breach of contract of the Concession Agreement including the Power Purchase Agreement and the Gas Supply Agreement; changes in law; political *force majeure* events and natural *force majeure* events (relating to the gas pipeline and the transmission facility). In parallel, the Government of Côte d'Ivoire has provided a counter guarantee to IDA through which IDA would be indemnified in the event of a call on the IDA Guarantee, thereby making the Ivorian government ultimately responsible for its own performance. The lenders also received Letters of Comfort from the Government of Côte d'Ivoire (Gaba, 2001).

3.2.2. Power Purchase Agreement and Project Incentives

The PPA is on a take-or-pay basis and consists of a capacity charge (±80 per cent) and an energy charge (±18 per cent). The contract duration is for 24 years, including the first two years of construction. Unlike CIPREL where a specific volume of power is contracted annually, Azito is required to adhere to a guaranteed minimum availability factor of 87.6 per cent (Azito pers. com., 2007). According to the agreement, the first 13 years will be charged at 18CFA franc/kWh (±2.7€ cents per kWh) and the following 11 years will attract a charge of 11CFA franc/kWh (±1.7€ cents per kWh). The average charge (excluding fuel) is therefore around 15CFA franc/kWh (2.2€ cents per kWh).

Like CIPREL, Azito was exempted from all taxes and import duties on the equipment for the plant in accordance with the country's investment incentive framework (Simon, 2006). In accordance with the BOOT agreement, the plant will be transferred to the state after 24 years of operation (in 2022). The economic rate of return on the project was estimated to be in the order of 20 per cent for a low growth scenario (World Bank, 1998).

3.2.3. Fuel and Project Performance

As described in section 2.3, Azito also runs on natural gas with the government assuming responsibility for gas provision, including all payment, as it does for CIPREL. A back-up supply of distillate diesel oil is kept on site (sufficient for five days). Unlike CIPREL, which had to wait for nearly a year for the gas infrastructure to be completely developed, Azito utilised domestic gas from the first day of operations. No problems have as of yet been encountered with regard to fuel supply for the plant.

Despite civil conflict (which coincided with the timing of COD), which prompted several contractors to flee the country, Azito came within budget and with a relatively short project time-table. Shortly after commissioning, Azito supplied more than 40 per cent of the country's domestic demand. Even in the midst of political turmoil, the project continued to operate and charges have to date all been paid in spite of forex transfer restrictions being imposed for a period of one week five days after President Bédié's government was overthrown (Gaba, 2001).[28]

4. Analysis of Outcomes

Cote d'Ivoire is a rare example in Sub-Saharan Africa in that development and investment outcomes of the IPPs both appear to be favourable, which may go a long way in explaining the sustainability of the projects to date. The country has received much needed power at affordable

[28] A temporary debt moratorium was also announced the second week after the coup d'état, but was lifted one week later (Gaba, 2001).

rates and investors have received expected returns as well as the opportunity to increase their market share. The factors contributing to these outcomes are explored from two perspectives in this section. Immediately below is a discussion of how country factors, largely those elements that fall under the purview of the host government, impacted on outcomes. This is followed in the next section by an examination of project-level factors, considered primarily within the realm of project sponsors.

4.1. Country Factors that Shaped Outcomes

Perhaps the most striking feature of Cote d'Ivoire's IPPs is that they have endured a period of civil strife virtually unscathed. The political and social unrest between 1999 and 2004, which caused among other things a 15 per cent decline in revenues to the utility, has had a limited impact on how projects have operated. Part of this may be explained away by the fact that the consumers are concentrated in the Abidjan region, where stability was achieved soon after the coup, and there are relatively few consumers in the north. This alone, however, is only part of the story of how IPPs came to successfully and sustainably account for more than half of national production. This section explores major factors, including the extent to which investors found the initial investment climate to be favourable, bidding practices, and policy frameworks and planning.

4.1.1. Investment Climate and Bidding Practices

Since its independence, Côte d'Ivoire has been the economic engine of the Union Economique et Monétaire Ouest Africaine (UEMOA), accounting for 40 per cent of its wealth even during the period of the country's economic decline from 1999 to 2004 (AfDB/OECD, 2004). At the time of CIPREL's negotiations (in 1994), although structural economic adjustments were in progress and the currency was devalued by half, investors anticipated that this planned devaluation would subsequently stimulate growth in the economy, and that this growth would permeate into the power sector as well. As it turned out, the devaluation of the CFA franc did contribute to a surge in economic growth and a corresponding increase in demand for electricity. Demand for electricity increased mainly due to industrial customers supporting export-oriented sectors. After the devaluation, tariffs increased by approximately 20 per cent (Lavigne, 1999). Despite a tariff increase in devalued CFA franc terms, revenues to CIE decreased in real terms initially. CIE was, however, eventually able to restore its accounts, primarily by revenue gained from exporting power to neighbouring states, a recurrent theme in this story (Jamal and Jones, 2005).[29]

By the time that Azito was negotiated, the country was well on its way to sustaining industrial growth, and hence there was huge interest from investors to development the country's second IPP, despite negative global IPP experiences as a result of the Asian financial currency crisis. The interest in the sector was at such a level that the government was able to change its approach from a negotiated agreement (as was the case with CIPREL), to awarding the contract for the second plant to the lowest bidder. It should also be noted here that the positive experience with Côte d'Ivoire and Africa's first IPP gave some momentum to the country's privatisation process and facilitated the development of the second plant.

Finally, due to the fact that the CFA franc is pegged to the Euro (historically through the French franc), Côte d'Ivoire has not experienced the problem of currency devaluation with hard currency

[29] Wages, however, an important input component decreased with the devaluation of the CFA franc (Plane, 1999).

charges as in the case of other African countries (e.g. Egypt and Ghana). Traditionally, inflation and devaluation of local currencies have threatened the income streams for power providers in Sub-Saharan Africa. In contrast to other Sub-Saharan countries, Côte d'Ivoire's inflation is considered low (at approximately 4 per cent) with the Banque Centrale des États de l'Afrique de l'Ouest (BCEAO) following a tight monetary policy in UEMOA countries. The currency devaluation occurred before CIPREL started commercial operations, and the PPA took into consideration this devaluation.

4.1.2. Clear Policy Framework and Coherent Power Sector Planning

Most pivotal in influencing recent policy was the drought experience that crippled the Ivorian economy in 1983 and 1984. The impact of the drought was multi-fold. First, with drought affecting the country's agricultural outputs, Cote d'Ivoire saw a significant decline in foreign currency earnings (otherwise gained from agricultural exports). Drought also impacted the largely hydro-dependent electricity sector and prompted a move to thermal. The move to thermal power and procuring fuel from international markets further strained the country's balance of payments due to limited foreign exchange earnings, as described above.

These experiences informed the government's electricity policy framework. Thermal power plants and the country's hydrocarbons would be developed to curb over reliance on hydro and expensive imported fuels. Furthermore, the private sector would develop these plants due to the financial constraints of the state and the national utility. Finally, an explicit policy was developed to make Cote d'Ivoire an electricity hub for the region (Ministry of Mines and Energy, pers. com., 2007).

Although a shift toward private sector participation and thermal power was made, affordability remained a chief concern of the government. To this end, gas turbines with a range of 75-105MW for CIPREL were chosen to allow the maximum number of manufacturers to participate in the bidding process. It was anticipated that this would put downward pressure on OEM tenders to supply the main plant hardware for the power station (World Bank, 1995:15). The technology choice was also based in anticipation of domestic gas, which ultimately has gone a long way in keeping power prices down.

Electricity exports, as noted throughout, have been a mainstay for the sector in the last decade. They have helped mitigate large demand and supply mismatches, especially during the period of civil unrest when national consumption decreased from 86 per cent of national production in 1995 to 70 per cent in 2002 (AfDB/OECD, 2004).[30] More specifically, as the construction of Azito was being completed, political events in the country took a turn for the worse. The demand for power, among other things, was dampened, which threatened to choke the estimated income stream that formed the economic basis for the plant. The silver lining for Côte d'Ivoire came in the misfortunes of its neighbours who were experiencing power deficits due to droughts and a general lack of power generation capacity. Exports to neighbouring countries, mainly Ghana, which accounted for more than 60 per cent of exported power in 2005, meant that income from electricity generated continued to flow in.

While the general policy and planning frameworks have worked in favour of positive development and investment outcomes, the role of the independent regulator appears not to have impacted outcomes, to date. Contractual agreements for the generated power are between the state and the sponsors. Since ANARE became operational only after the IPP deals had already

[30] It should be noted that this was before Azito was commissioned.

been signed, it had no role in the licensing or approval of the IPPs. Furthermore, apart from acting in an advisory capacity to the state, currently, the energy regulator has no legal mandate to effect substantial changes to contracts with IPPs. In the next round of negotiations with IPPs, it appears unlikely that ANARE will be given any opportunity to impact the terms of the agreements.[31] While one may argue that IPPs may be subject to less regulatory risk in this context, it is also arguable that in the absence of an active, empowered independent regulator, IPPs may also be subject to greater political interference.

4.1.3. The Future

Although Cote d'Ivoire has seen a marked change in its electricity supply industry (ESI), primarily via IPPs, but also through the private management of its utility, as of 2007, there is no long-term strategy for the management of the electricity utility beyond the expiry of the current contract in 2020. Undecided is whether the management contract with CIE will continue indefinitely or whether state organs will resume the operations of the national utility (Ministry of Mines and Energy 2007, pers. comm., 28 March).

In many respects, the concession agreement for management of the utility has been beneficial in that it has facilitated the introduction of IPPs, which in turn have been critical in ensuring security of supply, for Cote d'Ivoire and the region. Without CIE at the helm during this process, it is possible that new generation could have been seriously delayed or not built at all, given the lack of funding (Jamal and Jones, 2005). It is also widely acknowledged that the management company contributed to the utility's financial turn-around. For instance, there has been a marked improvement since private participation started in the Ivorian electricity sector. Billing recovery for collections increased from 70 per cent before CIE was instituted in 1990 to 98 per cent in 2004 (ANARE, 2005).

Still, has the private operator outlived its usefulness, particularly since privatization efforts are well underway? Or is such an operator necessary to maintain solvency and efficiency? For the foreseeable future, the management contract will remain and IPPs will continue to play an important role in bringing on additional capacity, since neither the state nor the utility has sufficient funds to invest in additional generation capacity.[32] Stakeholders have indicated that the decision to sign another 15 year contract with the CIE in 2005 may have been the most prudent, especially given the present political uncertainty. Such continuation may also restore investment confidence not only in the electricity sector but also to other sectors to which the CIE has been a supplier and distributor of reliable power.

4.2. Project Factors that Shaped Outcomes

[31] This may be due to the French legal framework for public infrastructure. French (civil) law differs from common law with regard to transactions for public services. Public service contracts under French law constitute a guarantee of public service commitments by the state, even within the context of opening up markets such as electricity. Thus, from a strictly legal perspective, the dominant role that the state plays is justified as the notion of public service is the principal criterion (ESI Africa, 2006; Fournier, 2005).

[32] At the inception of the country's IPP programme, it was intended that the government would institute a tariff adjustment framework that would cover 20 per cent financing of the investment programme over and above the operating costs and debt service (World Bank, 1995:23). This would translate to an 8 per cent rate of return on assets for the power sector. Up until December 1999, this was the case. However, since the coup in 1999, this policy has not been strictly followed (Ministry of Mines and Energy, pers. com., 2007).

Although there is some uncertainty about the way forward, there is a clear sense that the investment environment that predominated in the early 1990s and policy and planning frameworks have gone a long way in contributing to outcomes. Likewise, there are several factors, relevant to the project purview and investors specifically, that have contributed to outcomes. This section seeks to explore such factors.

4.2.1. Favourable Equity Partners

In the case of CIPREL, the partnership of SAUR and EDF helped ensure reliable power to the off-taker. At the time of CIPREL's negotiation, SAUR had over two decades of experience operating in the country. EDF, a public company, brought to the partnership decades of power plant operating experience in its domicile. It should also be noted that the selection of the two French companies is not surprising given that France has been the leading provider of technical assistance to Côte d'Ivoire since independence.

Perhaps what is more noteworthy than the relationship between the equity partners in CIPREL, is the relationship of the IPP and the physical off-taker of power – as they were virtually the same company. SAUR and EDF were awarded the management contract for operation of the utility four years prior to negotiating the country's first IPP. Given their track record in turning around the utility, the firms' prominence in IPPs may be seen as a logical extension both for country stakeholders and for foreign investors.

Involvement does not, however, end there. SAUR is also allied to the gas sector, through Foxtrot, a subsidiary of its parent company, Bouygues. Foxtrot, the biggest of the three suppliers has the Bouygues Group of France (parent company to SAUR) and EDF (in a partnership with Gaz de France, GDF) as principal shareholders (EIA, 2007).[33]

Thus, the firms are involved in all the major functions in the electricity supply chain—from gas exploration to power generation, transmission and distribution, and billing and collection. Their involvement across the supply chain gives EDF and SAUR influence over the operational risks of the business. In Africa, this situation may be unique to Côte d'Ivoire and may help in explaining the relative success of the country's IPPs.

Although SAUR was not involved in the second IPP, EDF did engage in Azito's initial development and operation. One may conclude that EDF's involvement in both the private management contract of the utility and the first IPP, may have contributed to the speed of decision making of the firm getting involved in the second IPP.

4.2.2. Debt Arrangements, Credit Enhancements and Risk Mitigation

The IDA loan that was secured from the World Bank and then on lent to CIPREL meant that interest costs were curbed, allowing the PPA charges to be reduced. The grace period on the loan in the case of CIPREL also meant that the sector had some 'breathing space' should unexpected events compromise the utility's ability to service its loan obligations. Although the initial debt-equity ratio for phase I started at 75:25, as previously noted, the financing of phase II ultimately changed the ratio to 86:14. This highly leveraged capital arrangement also translated into a lower

[33] Bouygues has 24 per cent shares in Foxtrot International and EDF/GDF has 12 per cent. Petroci, the Ivorian national petroleum company owns 40 per cent, and the remaining 24 per cent is held by Foxtrot itself (EIA, 2007).

cost of capital for the project and an increased rate of return. In 1995, the World Bank estimated the rate of return on the project of 189MW at 15.8 per cent and the return on equity at 21.4 per cent.[34]

For Azito, the commercial lenders are insured against default of payments through an IDA Partial Risk Guarantee, and commercial funds were more easily mobilised towards completion of the project due to the presence of such a guarantee. The existence of the guarantee and government counter guarantee also lowered the cost of capital, which resulted in more affordable power for consumers (UNDP, n.d.).

4.2.3. Positive Technical Performance

The first phase of CIPREL was in service less than eight months after the contracts were signed with the government. Since COD, CIPREL has honoured its commitments to supply the agreed power to the utility. In the same vane with Azito, notwithstanding the fact that some contractors left the site due to the coup, the delays in getting the plant commissioned were well contained.

Stakeholders within the government of Côte d'Ivoire have indicated their satisfaction with the reliability of the IPPs and the quality of supply (Ministry of Energy pers. com., 2007). The plants reduce the country's dependence on hydro, and the price was the best that they could negotiate under the circumstances. The fact that both operators were involved in discussions with the government to install additional capacity demonstrates their willing to continue engaging in the sector and that both parties are eager to replicate their experiences.[35]

Both IPPs perform well and have always met their contracted performances. Due to the manner in which the contracts are structured, Azito is slightly less expensive to run than CIPREL when Azito generates at the maximum capacity (CIE 2007, pers. comm., 27 March). This could reflect the downward pressure on the charges as a result of the ICB process and/or that the risks perceived were lower at the time that the second IPP was negotiated. It could also be due to the economies of scale that Azito has as compared to CIPREL (two turbines of 150MW each versus three turbines of 33MW and one of 110MW).

5. Conclusion

Côte d'Ivoire has experienced a number of exogenous events before and during the period of its ESI reforms, namely, severe droughts, a significant currency devaluation immediately pre-IPPs, political unrest, and suspension of a large part of revenue from power sales for an extended period. Still interest in the country's power sector has not been quelled - with both the IPPs keen to expand their interest in the generation sector. Few countries' power sectors would have sustained all these exogenous shocks. Why has Côte d'Ivoire fared so well? A stable currency that is pegged to the French franc since January 1994 and the Euro since 2002 means that revenue assurances in terms of exchange rate risks are more robust than what has been typical of most

[34] Dividends are also taxed, and at the time of the project's inception, such a tax was set at 12 per cent for French investors (World Bank, 1995).

[35] Initially the government did not want CIPREL or Azito to be involved in the development of the next IPP, preferring neither company to become too large in the market. At the start of the reform process, competition within the market was also envisaged (World Bank, 1995:12). However, due to time constraints, it was decided to engage the incumbents.

Sub-Saharan African IPPs. Coherent power sector planning after the droughts of the 1980s has resulted in the country achieving a more optimal mix of hydro and thermal power sources, and enough power to supply itself and help out its neighbours in their darkest hours (and thereby generating further revenue). Containing the political instability to the north of the country where there are relatively fewer consumers than in the south has aided the utility to keep head above water when revenues stopped to flow in from rebel controlled areas. The presence of domestic gas has helped keep power prices down relative to countries that have no domestic fuel resources. And the involvement of IPP sponsors throughout the power generation supply chain in part explains why investors are still eager to invest in the power sector.

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