13th Annual Shirley Playfair Lecture:

The Prospects for Competition in the Electricity Sector: from generation to distribution

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Keynote Speaker

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Preamble…

When I was first invited by Mr David Miller to speak, I missed several opportunities to decline: Member of JPS board - merely ICT professional moonlighting in energy - but none more glaring than when I was presented with the topic, to be delivered in 50 minutes. At first I had thought I had the freedom to speak on any subject related to Electricity, including my fixation on reducing electricity cost, everything else seems so subservient. But indeed, competition has been topical and extraordinarily important, and particularly so since Justice Bryan Sykes recent ruling; and indeed an expansive subject to which one couldn't possibly do justice in such a short time. In addition the licence I normally enjoy in the academic setting has been revoked by such time limitation. University Professor and most in my profession, some of my students, have the uncanny ability … My contrived solution to this problem (for this evening's address) is to engage in role reversal of sorts with my student.

I recall the last time that I was asked to speak about a similarly important subject in such a short time I thought I made really great use of the time… The subject was …simply said "Ladies and Gentlemen, it gives me great pleasure" and sat down…However, if I was required to match the economy of that presentation in relation to **…** "ladies and gentlemen … the state of the electricity sector in Jamaica… gives me great displeasure

But I can only hope to graze the surface of this vastly important topic and perhaps attempt to justify the inescapable superficiality by declaring, like the noted French anthropologist, Claude Levi-Strauss that an astute man should never attempt to give the right answers, but rather to pose the right questions, to stimulate further discussion…

Introduction

Despite all of our accomplishments and proud achievements and a stature in the world that defies our relative size, and the fact that the combination black, green, and gold is recognizable and respected anywhere on earth, the true promise of independence - has eluded us. Our Jubilee year highlighted this persistent contradiction; our athletes electrified the world and took us to the pinnacle of national pride with their surreal performances yet the ever pressing reality of the debt overhang and the generally unfavorable economic situation and social impoverishment remind us that the thriving, vibrant, industrious economy we crave, that engenders opportunities for our people to pursue their dreams and unlock their potential is, if anywhere, on the distant horizon.

We have not exhibited the fortitude of our athletes and cultural icons in confronting the economic and social challenges we have faced, and now we are exhibiting extreme economic sensitivity to global market forces and displaying classical evidence of social impoverishment such as high levels of corruption and crime. Similarly our environmental susceptibility represents a recurrent and serious threat to both the lives of residents and to the erosion of our already sparse physical assets. We are extremely vulnerable, and precariously poised at an inflection point, perhaps with an opportunity to rise to new heights but equally positioned to slide devastatingly down a rather slippery slope.

“Talk shop” is a concept we seemingly abhor, yet no matter how trifling the issue or how exigent the situation we can engage in lengthy debate and consensus doesn’t generally emerge easily for us. We have perfect national accord, though, and purposeful activism as a result of the stark recognition that the escalating cost of electricity is inimical to the interest of industry, commerce, and consumers alike and a deterrent to national growth and development; however, the accustomed debate is ushering this urgency into the realms of emergency.

And indeed the emergency is here. The high cost of energy in general, and electricity in particular, impose involuntary managerial restrictions on business enterprises and cause untold alarms to individuals. They increase the cost of operations, leading to higher prices for goods and services, which in turn suppresses demand, reduces profitability, restrains growth, cripples productivity and global competitiveness, sapping the economy of its vitality, dampening our economic growth prospects and further exacerbating Jamaica’s relative global competitiveness deficits and frustrating our national vision of developed status by 2030. The disease has been unmistakably diagnosed, yet the “doctors” quibble about the treatment, in some cases the prescription is unavailable and the prognosis may be stark indeed.

Research indications

Several international studies have confirmed the deleterious effects of steep energy costs, including its inverse relationship with GDP. Electricity prices exert tremendous influence on overall price levels. According to the World Bank Report of 2011 entitled "*Jamaica: Unlocking Growth,*" in addition to the high crime rate and the low skill level of workers, the cost of electricity is a major impediment to growth in Jamaica, serving to constrain the productive capacity, retard economic and social development and reduce the competitiveness of Jamaican firms in the regional and international marketplace.

International evidence also suggests that electricity consumption is the single best physical indicator of the overall economic activity within a country. There is also an extensive array of published literature that supports the existence of a causal relationship between electricity consumption and several economic measures, including the reaction of real GDP and other growth indicators to shocks in electricity consumption;. In other studies electricity prices have been shown to correlate significantly with variables such as consumer price index (CPI) - positively - and negatively with exports, and innovation.

Context

The electricity sector is capital intensive, and characterized by investments that are recoverable over extended timeframes. Globally there has been almost fixation on reform with the overriding objective of creating institutional arrangements that can provide better incentives for encouraging investment in capacity and technology to maximize efficiency and secure infrastructural integrity; controlling costs; reducing prices; enhancing the reliability and safety of supply; and generally shifting the risks of technology choices and operational inefficiencies away from consumers and towards suppliers. Evidence exists which demonstrates that electricity producers, with long histories of operating in competition-less environments and guaranteed profits have been slow to react to embrace reform.

It would not be unreasonable to conclude that in the case of Jamaica, the extended period of state ownership of the electricity infrastructure and service provision did not yield levels of efficiencies or produce the requisite infrastructural investments to guarantee reasonable long term thresholds of productivity, cost, and reliability. It is now the perception that the subsequent privatisation of the sector in 2001 under a regulated monopoly arrangement has not so far produced the goods either, and the pervasive perception (incorrectly or otherwise) is that this is largely so because such an arrangement, while predicated on the opportunity for greater investment in generation capacity and enhancing infrastructural integrity, have been dominated by profit-maximizing objectives under a regime of inadequately monitored regulatory incentives, and consumer-borne costs of operational inefficiencies.

Jamaica's Electricity Situation – Some History

In recent times, the Jamaica Public Service Company Limited (JPSCo) has come under significant public criticism largely because of escalating prices (although recently on a downward trend) which added fuel to the lingering perception that the structural arrangements for its operations are mere harbours for profiteering and promote little commitment to improved quality of service, higher levels of efficiency and lower end-user prices.

In a survey conducted by Jamaica's Consumer Affairs Commission, the overwhelming majority (over 90%) of electricity consumers expressed the opinion that JPS should neither be allowed to continue to monopolize the generation nor the distribution of electricity in Jamaica. When further interrogated about whether they would switch to another supplier, two thirds responded categorically in the affirmative while a quarter indicated their willingness to do so if the competition guarantees lower rates and better service.

Almost twenty years after the first considerations of the reform of the industry emerged from the Coopers and Lybrand 1993 study, the electricity sector in Jamaica wobbles uncertainly without an agreed national strategy while consumers, in the meantime, bear the burden of high electricity prices, the country reels from its deleterious impacts and embattled Jamaicans are left with no meaningful recourse but to further debate the merits of unbundling and the introduction of competition.

Competition

The traditional view was that the provision of electricity services constituted a natural monopoly consisting of the vertically integrated services of generation (creating electricity from other forms of energy), transmission (transporting it over high voltage lines) distribution (conveying electricity from the transmission network to the consumer), and retailing (the commercial dimensions of supplying to consumers). The earliest attempts at restructuring involved transforming state-owned utilities into regulated privatized entities, with bidders competing for the award of monopoly operations, under the guise that this arrangement would position the regulated monopoly to exploit economies of scale and scope and through investment incentives, induce performance improvements and lower costs.

Eventually technological innovations helped to (1) reduce the limits on the optimal size of power plants and encouraged the generation of smaller units of production and altered cost structures and (2) facilitate easy integration of generated units into transmission networks, thereby forcing a revision of the primacy of economies of scale as a dominant consideration for viability. Several new models of industry restructuring then emerged, which gave rise to notions of unbundling the hitherto vertically integrated processes of the value chain of the industry into contiguous segments (e.g. generation, transmission distribution marketing and

retail supply) with greater accommodation for competition in those segments that were amenable to it and regulation in those that were not.

There are a variety of competitive (unbundling) models; however, in the classical arrangement, generation, distribution, and retail services function under competitive market structures with supporting regulations to promote efficient access to the transmission network by wholesale buyers and sellers. Transmission infrastructure and network operations seem naturally monopolistic, as they accommodate common carriage - open access to and common use of the transmission grid – which is typically managed by an independent system operator who has the responsibility to schedule generation dispatch on merit, and maintain the physical integrity of the power network. The effectiveness of competition in the other segments is very sensitive to the regulatory regime that governs such a transmission system.

In Jamaica we have only flirted with competition. First, under the instigation of the IMF and World Bank, the GOJ and JPS considered and soon abandoned the idea of unbundling Generation from Transmission & Distribution - as a pre-condition for Privatization. Then the existing electricity license (2001) made provision for private companies, Independent Power Producers, under the supervision of the OUR, to compete for the right to increase generation capacity. But this is competition for the market (instead of in the market)…or more precisely competition for which IPP should be the monopoly provider of the next capacity increment … The winner then negotiates a power purchase agreement (PPA), a long term contract with a 20-year price arrangement, with the JPS, who will soon own 75% of generation capacity and the entire distribution network, and also control dispatch. JPS may also participate in these competitive bids and was the sole bidder and the awardee of the license to add the next 360MW of generation capacity.

Proponents of competition in our local market assert the superiority of competition over a regulated monopoly and disparage the latter as a flawed contrivance for providing incentives for efficiency. They often reiterate a potpourri of benefits sought or obtained elsewhere, which includes: increased economic efficiency, better investment decisions, downward pressure on the profit margins of generators and suppliers, higher labour productivity, reduction in consumer-borne costs, more efficient use of resources, greater incentive to reduce costs, that eventually help to lower prices. The million dollar question is whether our small-scale operations and market will allow us to realize the ultimate and hitherto elusive benefit of price reduction if we introduce competition.

Contending Views

That is why, in Jamaica, there is some ambivalence about the merits of competition. The objectors assert that while the rhetoric of competition is powerful, the benefits are certainly not assured. Competition, they say, in this environment is not guaranteed to produce reduced

electricity price; which is our equivalent of the Promised Land. This contention derives from concerns related to the substantial investment required to support requisite power infrastructure and service, the fact that effectiveness in this sector is influenced more by cost structure than by market structure, the hidden costs of competition, and potential loss of economies of scale.

Disbelievers insist that competition in the T&D sector (in the short to medium term) will not produce the desired price results, primarily because fuel accounts for approximately 65% of the cost of electricity and generation another 15%. On the Fuel side (at least with oil) the market presently favours short-term contracts with no hedging, which increases vulnerability to price volatility. On the other hand, investment in generation capacity requires the capability to secure capital through long term contracts that are typically amortizable over long periods of time (up to 20 years), and are therefore predicated on an off-take agreement (normally secured by the future output of the facility). It is therefore unlikely for competition to attract capital in this manner.

Other opponents of unbundling also point to the absence of rigorous economic analysis to determine whether a small system such as ours with peak demand of just over 600 MWs can support a competitive market, particularly where IPPs own approximately 200 MWs under long term contracts and a JPS-relative is positioned to own another 360 MWs (similarly under long-term contract). Hence Jamaica's demand would have to grow substantially to accommodate competitive generation. Even so, investments required to construct a moderately sized plant (say 120 MW, approximately $500M) exceed the FDI flowing into Jamaica for a typical year, making it difficult to project uptake for this kind of investment in competitive markets particularly without the certainty of supply.

Opponents of competition in T&D assert that for all these reasons, a regulated monopoly (which is not allowed to exert undue influence on price setting or output, as a normal monopoly does) provides the best opportunity for economic pricing where market size is very small. But many of these opponents of competition support some degree of liberalization such as Power Wheeling [EXPLAIN], Net Billing [...] and possibly the introduction of an Economic Development Tariff […].

Reality

Whatever the state of the debate, however, the recent ruling by Supreme Court, Justice Bryan Sykes rejecting the exclusivity of the JPS license, may very well prove to be a catalyst for terminating the endless debate and inciting genuine transformation in the sector.

Justice Sykes ruled that the JPS licence issued to the Jamaica Public Service Company (JPS) by the Minister of Mining and Energy in 2001 to provide electricity, "whether **generation**, **distribution** and **retailing** for the whole island" is not invalid, but the Minister does not have

the authority to grant the exclusive right to **transmit** electricity. I am not sure whether the Justice was being exquisitely precise but it was **transmission** exclusivity that he objected to. But recall from my earlier parenthetic definition of these four elements of the value chain mentioned in his judgement that transmission is the segment that many believe is least amenable to competition.

My own suspicion is that the legal wrangling in this case, which has already begun with an appeal and a counter appeal, will rage on for several years and if our fate depends on its final resolution, whenever that is, we are going "straight to hell." Our only salvation lies in purposeful, sensible, and respectful negotiations between the GOJ and the JPS that accommodate the peculiar but eminently rational interests of both; the JPS, on the one hand, as the holder of massive debt assumed as the sole off-taker and the GOJ, with the enormous responsibility to stimulate economic recovery and hope.

If good sense prevails then Justice Sykes' ruling presents an opportunity for several competitive market configurations that could radically change the Jamaican electricity industry. There are two very appealing possibilities that have competitive implications.

For example, my colleagues of the UWI think tank have researched and are convinced of the importance of promoting Combined Heat and Power (CHP) or Cogeneration Systems. CHP systems employ technology to trap the waste heat from conventional electrical power generation processes and convert it into useful thermal energy such as steam for manufacturing processes or air conditioning for commercial applications. These systems can have superior fuel efficiency ratios (75%-90%) compared to conventional generation technologies.

CHP systems can also become the catalyst for the creation of Industrial zones, another innovation that is immediately within Jamaica's reach and represents an opportunity for implementing competitive power distribution. Industrial zones are areas in which, unrelated manufacturing and other commercial entities that usually operate separately are co-located within the same geographic area, or zone, thereby utilizing energy in efficient ways, e.g. CHP systems may be used to provide electricity, steam, hot water, and air conditioning for co-located entities and possibly recycle industrial waste produced within the Industrial Zone. This arrangement typically lowers operating cost for each organization, and may contribute to significant improvements in environmental management.

Conclusion

Let me be unequivocal about an overwhelming sentiment that I merely alluded to earlier. By far the most important objective facing Jamaica in this Industry, today, right now, is the reduction of electricity price. If we could formulate a giant electricity optimization problem, the objective

function would have to be “minimize electricity price…subject to...” whatever the constraints are**.**

Yes there are several concerns that we must contend with, including but not limited to

- Increased competition in the electricity sector
- fuel diversity / energy security
- Greater operational and extractive efficiencies
- Increasing the share of renewables and accommodating environmental objective
- Improved regulatory diligence
- Greater domestic private sector investment/participation in the electricity sector
- Greater emphasis and awareness of energy conservation and demand-side management

But let me be true to today’s theme and focus, in closing, on only one from this set - increased competition in the sector, if we establish the most effective competitive configuration we possibly can, supported by all the famously articulated facilities such as net billing, net metering, feed in tariff, power wheeling, but fail to reduce price to levels that can stimulate economic activity, we have done nothing but engage in wanton sub-optimization.

That is why the UWI Think Tank is positioning to model various scenarios to contribute invaluable, informed insights into what the anatomy of the sector should look like and what choices will allow us to avoid the fault lines and hit the sweet spots.