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Liberalising Electricity Markets Beyond Public Service Obligations: Lessons for Developing States

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Abstract

In sequence with potable water, electricity is the next indispensable commodity of strategic, social, and economic importance within modern societies. Lauded as a key enabler for both economic and non-economic activities within nations, there is intimate correlation between access to electricity and the socio-economic advancement of a nation, due, specifically, to the catalytic effect of the former on the latter. Access to affordable, reliable and sustainable electricity by all segments of society is therefore essential as it enhances social equity and cohesion, amongst other benefits.

Historically and organically, the task of supplying electricity fell within the remit of the State, executed mainly through a vertically-integrated State-owned monopoly. Under such model, a number of developed States including the UK assured their nationals equal access to affordable electricity, based on the principle of universality. Governments exercised oversight over energy markets through policy frameworks which established regulators, as well as through relevant primary and secondary legislation.

Notwithstanding all the gains derived from the vertically-integrated monopoly model however, such model was labelled inefficient and was, amongst other shortcomings, criticised for supplying electricity at prices that were below the cost of production. In an effort to enhance efficiencies and improve access to affordable and reliable energy inter alia, nations across the globe, albeit not all of them and not at once, initiated the gradual process of liberalising their respective electricity markets. Liberalisation is a process that has opened up the supply-side of the market to competition in numerous countries, either partially or fully. By the same token, liberalisation granted the demand-side of the market some degree of choice – to choose a preferred supplier under the new market structure. As such, it heralded a new paradigm shift within electricity markets, foremost by introducing competition and stimulating efficiencies.

Despite the ovation surrounding liberalisation, particularly from private investors, the role and relevance of subsidised energy as a Public Service Obligation under competitive electricity markets became contestable, as both ends of the market embroil in a tug-of-war arguing either for or against the maintenance of Public Service Obligations under the new market model. Accordingly, this has brought into sharp focus the need to reconcile competition with entrenched public policy objectives.

This dissertation aims to analyse the concept of Public Service Obligations within the context of liberalised electricity markets, particularly following a transition from the classical, monopoly market model to a highly competitive market structure, operating predominantly at cost-recovery. In its conclusion, the dissertation will draw lessons from a policy and regulatory perspective, which developing States can use as a blueprint when contemplating reforms of their respective electricity markets.

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To my Maker be the glory.

Abbreviations

ESI	Electricity Supply Industry
EU	European Union
PSO	Public Service Obligation
SDG	Sustainable Development Goal
UK	United Kingdom
UN	United Nations
USA	United States of America

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1. Introduction

Contemporary societies require electricity for lighting, cooking, heating, cooling and for the functioning of electrical appliances and electronic devices, amongst other non-exhaustive uses. Indeed, access to electricity has been instrumental and a key enabler in the fulfilment of this dissertation, both in terms of lighting and the powering of computer and internet devices.

Energy specialist Klees[1] has described electricity as "a key factor" and a "prerequisite" for "most economic and many non-economic activities", and further impressed upon the fact that uninterrupted and universal access to reliable and affordable electricity is essential to propel the socio-economic development of a country[2]. Echoing similar sentiments, Bhattacharyya[3] regarded energy to be a key input to production processes, while Eberhard and van Horen described the entire energy sector to be "closely interwoven with the economy."[4] Burgess *et al* were equally elaborate in stating that "Electricity is an essential input for production, consumption, communication, and finance."[5] A 2017 report published by the United Nations Conference on Trade and Development (UNCTAD)[6] had emphasised that energy insecurity causes serious economic and social consequences upon societies. In the same vein, the sovereign Plurinational State of Bolivia[7] guaranteed the right to universal electricity access in its constitution and by the same token, its 65th President implored United Nations (UN) Member States to recognise electricity as a fundamental human right of all people on the planet[8]. In reference to the impact of energy upon rural areas, Ljung conceded to the fact that energy "plays an important role in enabling agricultural growth and alleviation of rural poverty."[9] The essential role of electricity as an enabling resource, required for day-to-day functioning in both developed and developing nations, can therefore never be overemphasised.

[1] Andreas Klees, *Electricity Law in South Africa*, (Cape Town: Juta & Company (Pty) Ltd, 2014), 23.
[2] Andreas Klees *Supra*.
[3] Bhattacharyya, S.C. *Energy Economics: Concepts, Issues, Markets and Governance,* (Springer-Verlag (London), 2011), 419.
[4] Eberhard, A, and Van Horen, C. *Poverty and power: Energy and the South African State,*(Pluto Press (UK), 1995), 28.
[5] Burgess, R, et al, (2020) page 158.
[6] United Nations Conference on Trade and Development (UNCTAD)(2017), page 88.
[7] Burgess, Robin, et al, (2020) page 145.
[8] Burgess, Robin, et al, (2020) page 145-146.
[9] Ljung, P. (2007), page 94.

Notwithstanding the indispensable nature of electricity as enumerated above, the stark reality facing most developing States[10] is, however, that not each one of their nationals has access to affordable and reliable electricity, and such reality is most prevalent amongst those who are situated in remote, rural areas[11]. According to statistics published in the *Tracking Sustainable Development Goal (SDG[12]) 7: Energy Progress Report*[13] of 2020, about 789 million people across the world were, as of 2018, still without access to electricity; most of whom are in Sub-Saharan Africa[14] and South Asian countries. The reasons for the lack of access to electricity vary with each State and range from factors such as affordability, poverty, lack of power infrastructure for reticulation, commercial viability for servicing isolated areas and investor appetite towards servicing certain customers, and poor governance amongst a myriad of other causative factors.

Owing to its significant role as a key enabler for socio-economic development, the Electricity Supply Industry has, over the years, drawn the attention of market players, politics and academia; with some stakeholders preferring to focus on the State's role in guaranteeing electricity supply as an essential resource to the majority of its citizens through either a policy and/or legal framework. Parallel to such reflections lie further deliberations as to whether or not a State is able to liberalise its electricity markets and still have some scope to maintain Public Service Obligations (PSOs).

While there is no universal definition of PSOs, the traditional, underlying notion is that an essential good or service, in this regard electricity, is supplied affordably on behalf of the State in order to sustain social justice as part of fulfilling public policy objectives. This thesis adopts the definition offered by Jones[15], namely that PSOs entail *"[g]uaranteeing, through regulatory standards, measures or requirements, of levels of consumer or environmental protection that might otherwise not be maintained through the simple operation of the market*

[10] Bhattacharyya, S.C. (2011), page 504.
[11] According to statistics presented by a UN report, the number of people that were without electricity in 2017 is estimated at around 840 million people most of whom are in sub-Saharan Africa where only 44 per cent of the population had access leaving a total of about 573 million people that are without electricity. (available at https://unstats.un.org/sdgs/report/2019/goal-07/, accessed 01 March 2021).
[12] SDG's are "an urgent call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests." (https://sdgs.un.org/goals).
[13] https://www.irena.org/publications/2020/May/Tracking-SDG7-The-Energy-Progress-Report-2020 (Accessed 13 March 2021).
[14] Bhattacharyya, S.C. *Energy Economics: Concepts, Issues, Markets and Governance,* (Springer-Verlag (London), 2011), 504.
[15] Cited in Karova R, (2012) at page 54.

mechanism." The concept of PSOs has widely been used and popularised in jurisdictions such as the United Kingdom (UK), while Australia and the Federal Republic of Germany respectively use "Community Service Obligations"[16] and "*Gemeinwirtschaftlichkeit"*[17], as analogous monikers for what is generally termed PSOs. Notwithstanding the name assigned to such obligations, however, PSOs within electricity markets aim to assure equitable access to affordable electricity for all consumers, including those who might find exclusion if the supply of such essential good was left to the absolute will and command of market mechanisms.

According to Karova, categories of PSOs which can be imposed on electricity companies range from "universal service, security issues (including the security of supply), the regularity of the service, the quality and price of the supply, and other issues such as environment protection, energy efficiency and climate protection."[18] PSOs within the Electricity Supply Industry therefore serve an important function of offsetting the negative impacts of competition on electricity supply, especially with respect to electricity reticulation to outlying rural areas. The converse is also true that in the absence of PSOs, equitable access to electricity for all, including the indigent and the remotely located consumer, for purposes of carrying out economic activities amongst others, will likely be a delusion because market forces on their own are not renowned for soft sentiments towards guaranteeing security of supply, especially to those who cannot afford the full cost of electricity supply as dictated by market dynamics.

[16] Martin, J.(1996), page 111.
[17] Gand, H. (1984), page 155.
[18] Karova, R.(2012), page 55.

2. Background

Traditionally, the generation, transmission, system operations, distribution and supply of electricity fell predominantly[19] within the remit of the State[20], and was rendered to the customers through a vertically integrated State-owned monopoly, at standardised, affordable prices that were below the cost of production. The focus and rationale had much to do with rendering a public service for social cohesion and inclusive development, and less to do with cost or who carries it. As such, electricity was rendered as part of the State's PSOs, as a matter of public policy objectives towards overall maintenance of social cohesion, which will be expounded in detail further below. As additional justification for the foregoing market structure, McGowan[21] alluded to the Morrisonian notion of public enterprises, which is the dominant principle behind PSOs in the UK, whose basis hinges on the fact that a public enterprise is an embodiment of public service owing to the mere 'fact' of public ownership. Equally, governments operated under such market model because "no one ever thought it could be done any other way."[22] For that reason, and for a good 100 years[23], the supply of electricity was considered a public good hence predominantly rendered through a vertically integrated State-owned monopoly until the 1980s[24] when the logic behind such market structure was, *inter alia*, reconsidered, and States began exploring various other market structure models.

At the time, market reforms were motivated by a myriad of factors including a particular State's desire to enhance security of electricity supply and development of the sector in line with the demands of sustainable development. With respect to a developing State that is capacity short for instance, in that it has insufficient energy capacity to meet demand,, reforms would be used as bait to entice investment and attract "private capital into the power sector"[25] of such jurisdiction. A particular State's foregoing aspirations would then necessitate the reform of its existing electricity market structure, which structure, in most instances, entailed the supply of electricity as a public service through a State-owned monopoly.

[19] Joskow, PL. (2006), page 2. In some States, the vertically integrated monopoly was privately owned; Erdogdu E, (2014), at page 2 wrote about private regulated monopolies to have operated in countries like Germany and the USA.
[20] Hunt, S, (2002), pages 2; 24-25; 27.
[21] McGowan, F.(1995), page 180.
[22] Hunt, S, (2002), page 25.
[23] Hunt, S, (2002), pages 24-25; 41.
[24] Erdogdu E, (2014), page 2.
[25] Erdogdu E, (2014), page 9.

Apart from being characterised by, *inter alia,* subsidies and tariffs that are far below the marginal cost of supply[26], the vertically integrated monopoly model equally turned out to be laden with inefficiency as well as other notable shortcomings[27]. As a result, various States explored alternative market models as early as the 1970s[28] for the United States of America and the mid-1980s[29] for the UK. Furthermore, influencing factors which include population growth[30], urbanisation, industrialisation, energy intensity of the country's Gross Domestic Product[31] and economic growth also stoked the demand for electricity, further crystalising the need for the particular governments to seek swift solutions in addressing the rising demand for electricity. Liberalisation of electricity markets was therefore deemed to be a part of such solutions, based on the perception that it would improve "sector performance"[32] through customer choice, lowered prices and service reliability, in comparison with the vertically integrated monopoly's deliverables.

In the course of liberalisation and the subsequent introduction of competition within electricity markets, however, lies several apprehensions; specifically that certain segments of society that are deemed uneconomical and areas that are remote may go without access to a reliable source of electricity because firms within competitive markets operate at cost recovery, hence there might be no high incentive to serve such categories of consumers. This then begs to question whether under liberalisation, the State will still have scope to fulfil public policy objectives that assure the supply of electricity to all consumers, at uniform tariff rates and on equal treatment. It is beyond doubt that segments of society that are either without or with limited access to electricity will find it challenging to socially cohere and fully participate in economic activity towards nation building, particularly because access to a reliable electricity service stimulates economic growth i.e. for small businesses that rely on electricity and it moreover facilitates the provision of other social services such as local education, health care and similar services (Clark, A., *et al*. (2015), p.4). Access to a sustainable, reliable, and affordable source of electricity or lack thereof, therefore, has social, economic as well as political consequences. For Sub-Saharan Africa in particular, the lack of access to electricity has empirically been found to constrain "modern economic

[26] Burgess, R, et al, (2020) page 148.
[27] McGowan, F.(1995), pages 173-175.
[28] Buchan, D. (2010), page 24: 'Energy liberalisation began in the late 1970s when the US started to try to free up its energy markets.'
[29] Helm, D. (2008), page 2 with respect to Britain.
[30] Berkovitch, I (1996), page 7; Elliott, D (2007), page 232.
[31] Elliott, D (2007), page 232.
[32] Joskow, PL. (2006), page 1.

activities, provision of public services, quality of life [and the] adoption of new technologies."[33]

From a multilateralism perspective, UN Member States have committed to achieve universal access to affordable, reliable, sustainable and modern electricity for all of their citizens by year 2030 as per SDG 7 . Although SDG 7 is legally nonbinding, there are compliance expectations resting upon all of the UN's 193 Member States. In their endeavour to achieve SDG 7, therefore, governments that have liberalised their electricity markets, especially those of developing States where access to electricity is limited, would have to find swift solutions that guarantee equitable access for all to an affordable, reliable, sustainable and modern source of electricity, amid a competitive market. Privatisation of the vertically integrated State-owned monopoly is also presumed to enhance efficiency gains within the electricity sector, however, it needs to be preceded by some form of unbundling, otherwise leaving the public monopoly structure all intact will culminate in the creation of a private monopoly, which defeats the aims of liberalisation. The UK presents a good benchmark of a jurisdiction that has considered privatisation of its electricity market. Based on Bhattacharya's observations, privatisation is, however, not the one-stop solution that has come to save the sector; Bhattacharya specifically observed that "..for much of the 1990s privatisation was heralded as the elixir that would transform ailing, lethargic state enterprises into sources of creative productivity and dynamism serving the public interest. But... [delivered] less than promised."[34]

Similarly, polar-opposite perceptions exist within the energy industry (investors, power producers, financiers, industry leaders, bureaucrats etc.) concerning PSOs and their associated State-funded *energy subsidies*. The inclination of subsidizing commercial energy prices by developing countries has severely been criticised by the World Bank[35] as well as the World Energy Council, who are both institutions of influence within the global energy community[36]. It is common knowledge that the investor-producer end of the market wields disparate interests which, in nature, are commercially-oriented and thus perceives competition and PSOs as mutually exclusive. On the other hand, the consumer end of the market, as well as governments, perceive the two concepts as compatible and can co-exist

[33] Blimpo, MP., and Cosgrove-Davies, M. (2019), page 1.
[34] Bhattacharyya, S.C. (2011), page 437.
[35] Berkovitch, I (1996), page 9.
[36] A broad group comprising institutions, organizations, entities and individuals across the globe who may or may not be spatially or legally connected but who share common interests in energy in general.

within the same competitive market. Under the circumstances, the State whose role is to "ensure that markets operate efficiently, equitably and sustainably"[37], would need to assume a guardianship role over both interests, as they prevail within a given market. In an endeavour to stimulate solutions for these discordant interests in the market, there is an urgent need for market participants as a first step to confront the unsettling discourse around the continued role, place, scope and future of Public Service Obligations within liberalised, competitive electricity markets.

This dissertation therefore aims to carry out a brief analysis of PSOs within the context of a liberalised, competitive electricity market, given, particularly, the divergent views existing within the market around the concept. In its conclusion, the dissertation will endeavour to respond to the issue whether competition and PSOs are reconcilable, specifically whether the latter can be maintained as a basic service within a competitive market, and if so, to what extent. In so doing, this dissertation will draw lessons that developing States can use as a blueprint when contemplating reforms of their respective electricity markets.

[37] Eberhard, A, and van Horen, C. *Poverty and power: Energy and the South African state,* (Pluto Press (UK), 1995), 5.

3. Electricity Market Reforms

The earliest signs of electricity market reforms through liberalisation can be traced back to the 1970s[38] with respect to the United States and the mid-1980s[39] with respect to the United Kingdom. To date, more than half of the world countries are considered to have introduced reform processes of some sort within their respective power sectors[40]. In as much as reform is considered "inevitable"[41] for contemporary electricity markets, and that reforms take place within "a political economic environment"[42], the rationale and underlying principle behind each reform varies from country to country.

Literature has offered several definitions[43] of what *liberalisation* is and this dissertation prefers the economics perspective definition offered by Oruç, namely that, "*Liberalization means opening up the market for new entrants, creating competition and thus freedom of choice for consumers.*"[44] A liberalized electricity market is therefore one where the primordial monopoly market structure has been reformed and transposed with competition, thereby allowing private entities to enter the market and competitively participate in the production and supply of electricity. Liberalisation is therefore a form of market reform by the State, entailing a gradual process of continuous improvement, restructuring, and refining the prevailing market structure. The liberalisation process can thus be described as the gradual *metamorphosis* of market structures from a vertically integrated State-owned monopoly model into either a partially or fully competitive electricity market model.

Typically, market reforms through liberalisation are necessitated by a myriad of reasons depending on the category under which a specific country falls, which, based on its prevailing internal energy capacity, can either be designated as a first category State with excess capacity, or a second category State which is capacity short. For capacity short countries, the quest to enhance internal energy capacity and improve efficiencies forms part of the reasons for liberalizing such electricity markets. Factors such as inadequate and insufficient investment in energy, energy-dependence, a perpetual net-energy importing

[38] Buchan, D. (2010), page 24: "Energy liberalisation began in the late 1970s when the US started to try to free up its energy markets."
[39] Helm, D. (2008), page 2 with respect to Britain.
[40] Erdogdu, E. (2012), page 1.
[41] Erdogdu, E. (2012), page 3.
[42] Erdogdu, E. (2012), page 3.
[43] Joskow, PL. (2006), page 12; Elliott, D (1999), page 3.
[44] Sertaç Oruç, "Strategic Behaviour in Liberalised Electricity Sectors: Game Theoretical formal Modeling in Policy Analysis" (Delft University of Technology, 2014), page 12.

status, increases in demand for electricity due to industrialization and other economic activities, population growth, and urbanization remain amongst the driving forces behind the liberalisation of energy markets in capacity short, developing countries. Electricity markets, especially the ones operating on a single buyer model, have, over the years, been characterized by operational inefficiencies of the State-owned utility, as well as a lack of accountability for its performance. This view has been crystalized by Joskow who alluded to the fact that prior to reforms, the electricity sectors of developing nations have been "*characterized by low labor productivity, poor service quality, high system losses, inadequate investment in power supply facilities, unavailability of service to large portions of the population and prices that were too low to cover costs and support new investment."*[45] Furthermore, the European experience revealed that compared to public utilities, "market forces produce a better allocation of resources and greater effectiveness in the supply of services"[46] hence the appetite for liberalisation. Efficiencies for which liberalisation is renowned are perceived to emanate from the pressure of competition[47] and consumer choice, and are, as such, considered to spur a positive ripple effect on other sectors of the economy. In such regard, significant energy price reductions were observed following liberalization in the UK, as well as German's electricity market[48].

Notwithstanding the penchant for competitive markets, for reasons of greater efficiency, amongst others, liberalisation is not a one-stop solution and does not always deliver on all its promises, as history and industry experience have shown. Indeed, part of the drawbacks of liberalisation are evident in its after-effects, particularly its impact on vulnerable customers who, in the face of liberalisation, will be worse off[49] in terms of service provision. Eberhard and van Horen further encapsulated the demerits of competition by intimating that "competition usually worked against interconnection and encouraged investment only in the most lucrative routes. Private industry was not willing to reticulate those areas where population densities were low or where low-income levels would mean low consumption of electricity."[50]

[45] Joskow, PL. (2006), page 3 (citing: Besant-Jones, 1993; World Bank, 1994; Bacon and Besant-Jones, 2001).
[46] Newbery, DM. (2002), page 919.
[47] Department of Trade and Industry (DTI) (2000), page 3.
[48] Department of Trade and Industry (DTI) (2000), page 4-5.
[49] Fernández-Gutiérrez, M, *et al*.(2017), page 1.
[50] Eberhard, A, and Van Horen, C. *Poverty and power: Energy and the South African state,*(Pluto Press (UK), 1995), 5.

To conclude on the overview of electricity market reforms, therefore, this dissertation draws on the views expressed by Rusche that "…competition is by no means a panacea, but a strong force that needs to be tamed by regulation and rules, in order to avoid market failure."[51] As such, a liberalized, competitive electricity market cannot and should not be left to its own devices under the assumption that it will self-heal by striking the right balance between preserving competition and satisfying PSOs. Some degree of regulation and policy oversight is still required in order to keep market forces in check and ensure, *inter alia*, that market power is not abused[52] and markets are not manipulated[53] on the basis of information asymmetries; that consumers are not short-changed, and that matters pertaining to the social, economic, and environmental impact of electricity supply are not disregarded. Adequate doses of oversight by the State through policy would equally ensure that specific public policy objectives are met, taking care not to distort the fundaments of a competitive market. In such regard, Bhattacharyya alluded to the fact that although markets were previously presumed to have all the solutions, aspects such as security of supply, investments in socially desired areas, climate and environmental protection and the like cannot all be left alone to the market.[54] There is therefore rational justification for the scope of this dissertation which is to consider at length the concept of PSOs – an aspect which, as experience has shown, should never be left to the sole execution and singular resolve of market forces.

[51] Rusche, TM. (2006), page 486.
[52] Newbery, DM. (2002), page 922.
[53] Newbery, DM. (2002), page 922.
[54] Bhattacharyya, S.C. (2011), page 420.

4. Public Service Obligations

As alluded to in the preceding sections, the production and supply of electricity has traditionally been within the remit of the State, typically rendered as a universal service and at uniform prices, through a vertically integrated State-owned monopoly. As such, the State guaranteed security of supply. For countries such as the USA, however, electricity monopolies were mainly privately owned.

According to Colley[55], governments "fulfil multiple obligations which may conflict"; within the context of electricity supply therefore, the quest for competition to enhance efficiencies within the sector on the one hand, and the appeal to fulfil public policy objectives on the other hand, is one such example because the two concepts are not necessarily harmonious. In reiteration, Public Service Obligations entail *"[g]uaranteeing, through regulatory standards, measures or requirements, of levels of consumer or environmental protection that might otherwise not be maintained through the simple operation of the market mechanism."*[56] Within the framework of electricity markets, public services have been defined by Finger and Finon[57] "as the reliable delivery of electricity to the household at affordable prices and in equal conditions of treatment." Public Service Obligations therefore stem from the idea of the State guaranteeing through policies, laws and such other instruments, the delivery of an essential public good or service.

The essence of PSOs in reference to the UK jurisdiction has perfectly been summed up by Defeuilley who highlighted that at the core of a public service obligation lies the principle of "universality"[58], which principle entails obligations such as "access to essential facilities at reasonable prices, non-discrimination, quality, adaptation and reliability."[59] Karova on the other hand indicated that PSOs exist for the purpose of "counteracting the adverse effects that the liberalisation of electricity markets might have on the supply of electricity."[60] In the absence of PSOs to offset the negative impacts of competition therefore, specific categories of consumers, despite their unique circumstances, would be left to the mercy of market forces.

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[55] Peter Colley*, Reforming Energy: Sustainable Futures and Global Labour, (*London: Pluto Press, 1997), 122.
[56] Cited in Karova R, (2012) at page 54.
[57] Finger M, and Finon D, *From the 'public service' model to the 'universal service' obligation*. (2011), 6.
[58] Defeuilley, (1999), page 27.
[59] Defeuilley, (1999), page 27.
[60] Karova, R.(2012), pages 53-54.

Based on a particular State's preference, as dictated and necessitated by its own unique circumstances, PSOs can either take the form of a legal, social, or moral obligation with the ultimate goal of maintaining equity within electricity supply. The Electricity Directive (European Union (EU)) 2019/944 which amended Directive 2012/27/EU for instance contains a clear stipulation regarding PSOs in electricity supply; Directive 22 specifically requires the EU's Member States to ensure that household customers, and where appropriate small enterprises, "*enjoy the right to be supplied with electricity of a specified quality at clearly comparable, transparent and competitive prices."*[61]

Owing to the causal nexus[62] between access to electricity and socio-economic development, access to affordable, reliable, and secure electricity is crucial in order to create an enabling environment within which energy consumers can engage in various electricity-dependent activities, including economic activities. The converse is equally true in that a lack of access to modern forms of energy such as electricity has the propensity to perpetuate *energy poverty* and *energy apartheid*, two analogous phenomena that are fast gaining traction within the global energy community. An energy supply framework that aims to facilitate access to affordable and reliable electricity for all in a given society, through the aid of market interventions such as subsidies, has the potential to achieve a broad-based energy outreach, and ultimately enhance socio-economic development within the particular society.

In its capacity as *guardian of public interest*[63], the State can introduce and implement subsidies that are specifically tailored and targeted at guaranteeing the fulfilment of electricity access and supply to lower income groups, as well as remote areas. In such regard, governments can make use of the economics technique of "targeting"[64] to effectuate PSOs as such. Through targeted subsidies, the energy system would be able to sieve out high-income earners who may unfairly seek to benefit from the energy subsidy. Care must, however, be taken to ensure that the competitive market does not end up oversaturated with superfluous subsidies which will ultimately have a distorting effect on competition. Perverse

[61] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?ur, accessed 01 March 2021.
[62] Sustainable Energy for All.(2019). *Integrated Electrification Pathways for Universal Access to Electricity: A Primer*. Page 9: "Enabling access to electricity can bolster economic development...".
[63] Erdogdu E, (2014), page 2.
[64] Langørgen, A. (2011), page 195.

effects of subsidies were, however, elaborated by Bhattacharyya[65] who indicated that subsidies tend to "send wrong price signals to consumers and promote over-consumption...; they divert scarce financial resources at the cost of depriving other needs; they hinder growth of alternatives and act as a trade barrier." With reference to Sub-Saharan Africa specifically, Kojima *et al*[66] described the subsidies therein as "highly regressive" and that they are quick and politically expedient to implement, but equally quick to take root and challenging to remove. Against this background, States should therefore exercise restraint when implementing subsidies as apparatuses for fulfilling PSOs.

There are various methods through which the cost implications of fulfilling PSOs can be financed, which can either be directly, in the form of government-funded energy subsidies secured through a State budgetary allocation, or indirectly through a sectoral, industry or PSO levy. Following a consultative process, countries such as Ireland[67] charge their electricity customers a PSO levy in order to support national policy objectives; Denmark and Poland respectively adopted a similar method of charging a PSO levy.

Following market liberalisation, the use of subsidies as apparatus through which PSOs are fulfilled has been a contentious issue within the industry, in academia as well as the global energy community; simply because by their nature, subsidies translate to electricity being supplied to some of the consumers at subsidised prices that are below the cost of production. On that score, the industry has seen both proponents and opponents of energy subsidies. Berkovitch attempted a justification for subsidies by alluding to the fact that the supply of "energy at prices below the costs of production and distribution has been based on the view that this would help poorer consumers...for social reasons, sometimes venally as a political favour or more virtuously to promote faster industrialisation."[68] On the other hand, critics of energy subsidies argue that subsidies distort competition[69], while pragmatists support the cause on the understanding that "*energy subsidies should be directed at encouraging access to services rather than helping to cover the operating costs of providing the services*."[70]

[65] Bhattacharyya, S.C. (2011), page 320.
[66] Kojima M, *et al* (2014), page iv.
[67] Electricity Regulation Act, 1999 (Ireland), section 39 (1) & (5); Irish PSO Levy Proposed Decision Paper, available at https://www.cru.ie/wp-content/uploads/2014/07/CER14125-PSO-Levy-2014-15-Proposed-Decision-Paper.pdf
[68] Berkovitch, I (1996), page 10.
[69] Kojima M, *et al* (2014), page v; Barnes, D. F., & Halpern, J. (2000), page 64.
[70] Barnes, DF., and Halpern, J. (2000), page 61.

By regarding the provision of electricity to certain segments of society as a PSO, in this respect the indigent and remote areas, governments of particularly developing countries would, in so doing, level the playing field in which all are enabled to participate in energy-dependent economic activities. By the same token, access to electricity will minimize the rural communities' overreliance on biomass, thereby lowering the carbon footprint and other adverse environmental impacts generated by the use of biomass. A State that aims to curb against air pollution generated by the energy industry can for instance impose environmental protection obligations, incorporated as a legal duty within its domestic statutes and/or incorporated as a social obligation within its local energy and environmental policies; and particularly owed to the communities in which the energy company operates or where a particular energy project is located.

From the foregoing, it is therefore clear as to why PSOs still matter within the scope and general discourse of liberalisation, even in 2021, which is more than 30 years later since the advent of energy liberalisation in the UK during the mid-1980s.

5. Liberalisation Beyond PSOs

Due to its essential and enabling role within contemporary societies and modern economies, electricity supply in general and reforms to electricity market structures in particular, draws interest, and attracts attention from both political, economic and social realms. Joskow summed it up aptly by indicating that "[b]ecause of the critical role that economical and reliable supplies of electricity play in the economy, there is a profound public interest in ensuring that these reforms improve rather than degrade the performance of the electricity sector."[71]

Following liberalisation of electricity markets therefore, apprehensions and speculations abound regarding the net effect of liberalisation on electricity supply. One such concern[72] emanates from the average consumer who benefited immensely from subsidised low-cost energy under the previous market model, apprehensive that public service provision will be abandoned in favour of shareholder interests. Central to the average consumer's main concern is the question whether or not the supply of electricity would still be affordable under a competitive market structure. There is justification to such apprehensions since liberalisation does indeed negatively affect public services as defined traditionally[73]. Furthermore, Independent Power Producers or such other private entities entering upon the energy market are commercial ventures, hence prone to serve only where they derive the most commercial gain. As such, commercially-driven ventures may not necessarily accord public policy objectives prominence to the same degree a State-owned energy utility would; leaving a segment of consumers hanging in the balance as far as access to affordable and reliable supply of electricity is concerned.

In his article for the Fordham International Law Journal, Albers alluded to a number of concerns that could arise from opening up electricity markets to competition; he stated that such concerns originate mainly from the "*beneficiaries of the previous market organization"*, specifically regarding the *future* and *quality of* such *services.* Albers further alluded that "potential entrants in the liberalized markets, on the other hand, fear that enterprises entrusted with public service obligations will be granted special rights or public funds, which

[71] Joskow, PL. (1998), page 26.
[72] Department of Trade and Industry (DTI) (2000), page 7.
[73] Finger M, and Finon D, (1997), page 7.

give them an unfair advantage in the competition for customers."[74] As such, new entrants in the market aim to operate in a level playing field without distortion to market competitiveness – and that is their main concern. In reference to New Zealand's electricity market reform by way of privatization, Bertram shared his views on possible tensions that can arise as a result of market reform, alluding to the fact that "electricity policy-making since 1986 has involved ongoing tension between those who saw privatization under generic competition law... and those who retained the idea of electricity as an essential public service for the price and quality of which the state remained responsible, implying ongoing state participation and/or regulation."[75] Any act, process or conduct which is aimed at reforming the average electricity market, either through liberalisation or privatization, would therefore attract the attention of market participants and will certainly be met with public scrutiny.

In the middle of a liberalizing electricity market stands the State, whose minimum function is not only to create an enabling legal and policy regulatory framework, but equally to "ensure reliable and affordable access to energy or energy services, including ensuring security of supply; and that the energy industries contribute to economic growth and resilience whilst reducing risk."[76] Through a fit-for-purpose, integrated energy policy framework, however, the State would be able to fulfil, amongst its other roles, the crucial guardianship role over the market, by easing the manner in which business is conducted, and by creating an enabling environment that is socially sound, legally secure, politically stable and economically feasible, through which electricity is produced and sold amongst market participants. Pugh describes such role as a *balancing* act between "the financial needs of service providers and the ability of consumers to pay for services."[77] Bhattacharyya echoed similar sentiments by underscoring the essence of "selective and judicious use of market interventions[78] to make energy supply affordable but[79] ensuring financial viability of energy supply"[80]; this is based upon his further conviction that reforms do indeed impact the poor "as prices are reformed and cross-subsidies are removed."[81]

[74] Albers, M. (2001), page 941.
[75] Bertram, G, (2013), page 646.
[76] Colley (1997), 122.
[77] Pugh, G. (2019), page 10.
[78] Underlined for emphasis by this researcher.
[79] Underlined for emphasis by this researcher.
[80] Bhattacharyya, S.C. (2011), page 434. (Key words are underlined for emphasis).
[81] Bhattacharyya, S.C. (2011), page 720.

In order to meet the growing demand for electricity, several developing States[82] are presently going through the gradual odontiasis phase of having to embrace change and liberalise their electricity markets. Such phase of market structure odontiasis entails letting go of the vertically integrated State-owned monopoly which, for most countries operating thereunder, has become a perpetual burden[83] upon the State budget. As soon as it is established that liberalisation is the ideal solution to addressing a particular State's energy challenges, the next question would be, how does that affect the State's other obligations including, its multilateral, legally nonbinding commitment to meet the UN's sustainable development goals? Particularly the goal to provide equitable energy access for all by 2030? And if liberalisation is the preferred approach, where does that leave the State's entrenched traditional responsibility of supplying electricity as a universal service for all? Conversely, at what cost can PSOs either be maintained or discontinued under a liberalised market? This dissertation is therefore an attempt at providing answers to some of these questions.

As alluded to in preceding sections, a sovereign State endowed with natural energy resources is able to transform its electricity market structure from a monopoly model into a competitive market. Various motives exist behind a State's decision to liberalize its electricity market which include the desire to attract private equity to the sector, as well as the appeal to enhance efficiencies within electricity supply. Whatsoever the motive may be, access to reliable electricity has proven to stimulate socio-economic growth and propel the industrialization of nations. The broader the outreach of energy access therefore, the more people are enabled to reap the benefits of this indispensable good. Recurrent conceptions found within literature[84] , however, reveal that once a market is liberalized, competitors start to engage in what is commonly known as "cream-skimming or cherry-picking"[85] with the result that non-profitable segments of the market, and customers who cannot afford the full cost of electricity are likely not to be served, particularly in the absence of intervening leverage from PSOs. It is against this background that following market liberalisation, deliberate efforts need to be devoted towards assuring that access to reliable and affordable electricity remains available to all as a basic service. When all is said and done, however, access to electricity must not, and should never equate to a free for all service.

[82] To mention a few: South Africa, Ghana, Morocco, Rwanda, available at (https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2021/March/Renewable-Energy-Transition-Africa_Country_Studies_2021.pdf?la). (Accessed 13 March 2021).
[83] Scott, A (2015), page 3.
[84] Finger M, and Finon D, (1997), page 5.
[85] Finger M, and Finon D, (1997), page 6; Department of Trade and Industry (DTI) (2000) intimated at page 2 that the poor can be less attractive as customers in a competitive market.

As alluded to in earlier sections, government subsidies are another cause for concern within the context of liberalisation, and which have been perceived by some to lead to market distortions. Subsidized commercial energy prices have particularly been criticized by both the World Energy Council as well as the World Bank (Berkovitch, 1996: page 7), thereby signaling that subsidies do not find much support from thought leaders and lead financiers within the global energy community. Bhattacharyya leaned on the same understanding with reference to subsidized renewable energy that "sustainable, long-term solutions for energy access problem cannot rely on subsidized supply of clean energies."[86] Conversely, the beneficiaries and benefactors of subsidies respectively perceive subsidized electricity to be the State's systematic approach and time-tested method of assuring that the public policy objective of inclusive development is fulfilled, more so following market liberalisation. The ideal situation has, however, been canvassed by Defeuilley that, "the task of the regulator is not only to promote and support the introduction of competitive forces [but it] is also to create the conditions for the adoption of a market configuration in which the competitive forces will not be harmful to public service obligations."[87] Drawing a lesson from the experience of the air transport services industry[88] when imposing PSOs, the electricity supply industry should aim to confine PSOs to underserved remote areas in order to maintain limited encroachments upon market forces, while assuring equitable supply of electricity to such underserved areas for the sustenance of social and economic activities.

Governments have an option to fulfil PSOs either through State-owned enterprises, State-owned companies, private companies or through such other feasible arrangements. The cost implication of fulfilling PSOs can be financed either through a PSO levy as in the case of Ireland, or through a targeted subsidy offered to specific indigent customers or outlying areas, or as a reimbursement cost to entities entrusted with the role of fulfilling PSOs on behalf of the State. While the foregoing subsidy-infused model has its own merits and demerits, what is beyond reproach, however, is the fact that the contemporary State should no longer sustain the norm of supplying electricity at zero cost. Archaic and uneconomical practices of supplying electricity at no cost will have to be shelved and make way for the supply of electricity as a commercial good for which the aim ought to be consistent supply,

[86] Bhattacharyya, S.C. *Energy Economics: Concepts, Issues, Markets and Governance,* (Springer-Verlag (London), 2011), 520.
[87] Defeuilley, (1999), page 39.
[88] Williams, G, and Pagliari R.(2004), page 55: "the rationale for imposing a PSO is to sustain air services to remote regions for economic development purposes."

efficiency, and of course commercial viability without oblivion to the energy needs of the indigent, once competitive market forces are at play. Access to affordable and reliable electricity, as dissected by Pugh[89], has propensity to facilitate the attainment of other socio-economic benefits such as basic education, health care and small-scale local entrepreneurship. Because of their ability to facilitate inclusive access to electricity, for dignified living and participation in economic activities, PSOs are therefore that life-giving umbilical cord between competitive market forces and the indigent, remote consumer. Be that as it may, however, PSOs should be imposed with caution and fulfilled conscientiously.

The stark reality facing the majority of developing States is inequitable and disproportionate access to a service as essential as electricity across all segments of society, which further impedes the State's ability to fully achieve its developmental goals. As the saying goes within prenatal care circles, there is no such thing as partial pregnancy, either there is pregnancy or there is none; the same goes for electricity supply. If the aim is to realize broad-based, inclusive development, all segments of society must have access to reliable and affordable electricity because a partial access will not achieve the same ends. Along the same lines, a developing State cannot hope to fully industrialise while the majority of its people lag behind in accessing electricity which is one of the key components towards achieving such end.

Cognizant of the separate but complimentary roles assumed by the State and markets in economic development, Rangarajan[90] emphasized that "the market must be allowed to work wherever it can function efficiently and the [S]tate must step in wherever the market does not succeed." Guaranteeing access to electricity for all including those located in less economical areas is one such obligation which market mechanisms may fail to achieve and the State must hence step in, but conscientiously so.

Following liberalisation therefore, PSOs can still be maintained within the competitive marketplace as part of the State's mechanisms to assure electricity supply for all segments of society. Apprehensions and divergent views pervading the sector with respect to the impacts of competition, PSOs and subsidies can be addressed through a consultative, integrated approach to energy planning and development, a process which will eventually end with an integrated energy framework. Eberhard and van Horen has described the integrated energy framework as a framework that "permits the development of a coherent

[89] Pugh, G. (2019), page 7.
[90] Rangarajan, C. (2000) page 1386.

set of policies which meet the needs of any interrelated (and sometimes conflicting) national objectives."[91]

[91] Eberhard, A, and van Horen, C. *Poverty and power: Energy and the South African state,*(Pluto Press (UK), 1995), 13.

6. Lessons for Developing States

Developed and developing States alike face various energy challenges that may be similar in nature but are certainly not identical; neither are their political, social, environmental, technological, economical, and legal landscapes the same. As such, one cannot expect such diverse jurisdictions to resolve their energy challenges in like manner, following the same method and using the same formula. The historical, political, cultural, and social context of each State would therefore play a role in the approach undetaken in such resolve. That being said, there are several lessons a developing State can learn from the progenitors of liberalisation, when undergoing the arduous task of reforming the structure of its electricity market, and when imposing PSOs within a liberalized, competitive market.

First and foremost, it would be imperative for the government of a developing State to take cognizance of the reality of dual societies existing within its jurisdiction; at the one end of the spectrum lies those who can afford to keep the lights on for the entire night while at the other end stands the segment of society that has limited to no access to modern forms of energy, and which more often than not makes up the majority of the population.. Goldemberg *et al* crystalized the foregoing notion by referring to energy as "an instrument for development" and that there are dual societies found within developing countries, comprised of the elite and the poor (both urban and rural poor); the quartet pronounced further that such social stratification has "shaped the current energy systems", a reality which, in their view, should not be ignored as "all global energy strategies have done."[92] Given the reality that dual societies exist within developing States, a sustained lack of attention to the subject in year 2021, which is more than 30 years since the first market reforms were recorded in the UK in the mid-1980s, would therefore be a grave injustice towards the cause of either validating or nullifying the relevance of PSOs within competitive electricity markets.

The United Nations – an intergovernmental organization boasting a total membership of 193 sovereign States – had launched the renowned SDGs in 2015 and by so doing reiterated the importance of energy to development, particularly through SDG 7. SDG 7 unequivocally implores all UN Member States to ensure "access to affordable, reliable, sustainable and modern energy services"[93] for all by 2030. Similar sentiments were echoed by a UN Policy

[92] Goldemberg, J. (1988), pages 193 and 202.
[93] SDG 7 of the UN.

Brief on Achieving Universal Access to Electricity, to the effect that "no country has gone from poverty to prosperity without making electricity affordable and available in bulk for productive uses."[94] Notwithstanding such noble efforts by the UN, to date we are almost halfway towards the deadline of Agenda 2030 and most developing States have not yet achieved substantial access to affordable and reliable electricity by a major segment of their nationals, particularly the indigent and those situated in remote, rural and off-grid areas. The converse holds true for the majority of developed States.

According to earlier studies, the majority of the world population that is without access to electricity is predominantly found in Sub-Saharan Africa[95] as well as South Asian countries. It is therefore incumbent upon each developing State[96] to explore various methods, initiatives, and opportunities towards attaining universal access to electricity for all; by year 2030 or earlier with respect to the members of the UN. Reforming the electricity supply industry in order to enhance energy access, capacity and improve efficiencies is one such method a Member State can implement towards meeting SDG 7. By guaranteeing access to electricity for all, States would, through that effort, be able to furthermore facilitate the attainment of other public policy objectives such as the provision of communication, health care and education *inter alia*.

The ideal electricity market structure for any developing State would entail an energy ecosystem (with an adequate integrated energy supply policy framework) that is able to withstand divergent market influences, in that it is both able "to meet socio-economic needs and attract necessary investment."[97]

In their endeavor to liberalize electricity markets while at the same time assuring access to electricity for all consumers, developing States need to be attentive to all effects in order not to distort competition which is intended to deliver additional energy capacity and efficiencies within the market. By the same token, care should be taken not to exert undue political pressure, or stifle the commercial industry with political interference, or to leave everything to market mechanisms in hope that the latter will satisfactorily handle PSOs. Some degree

[94] United Nations. (2018). *Achieving Universal Access to Electricity* (Policy Brief No. 1). International Energy Agency (IEA), United Nations Development Programme (UNDP) and International Renewable Energy Agency (IRENA). https://sustainabledevelopment.un.org/content/documents/17462PB1.pdf, page 6.
[95] Bhattacharyya, S.C. *Energy Economics: Concepts, Issues, Markets and Governance,* (Springer-Verlag (London), 2011), 504.
[96] The majority of developing States are members of the UN.
[97] Sustainable Energy for All.(2019). *Integrated Electrification Pathways for Universal Access to Electricity: A Primer*. Page 10.

of regulation through adequate policies is still necessary in order to maintain the right balance and keep the interests of all market participants in check. Care should equally be taken to ensure that the reform of the Electricity Supply Industry does not entail intact privatisation of public monopolies, without first undergoing unbundling, because doing so would outright lead to the creation of private monopolies, a deed which has proven to be anticompetitive.

There are great lessons that developing States can learn from the UK, as well as the French regulatory experiences, which have been summed up by Defeuilley as follows, "the main issue to consider is the setting of regulatory frameworks which enable the formation of a market configuration in which the competitive forces are introduced, but not at the expense of public service obligations."[98]

The French regulatory experience is particularly worth underscoring because following reform, France maintained a stable regulatory regime which encouraged an investment-oriented pattern and further encouraged continuous systems enhancement ahead of declaring and distributing dividends which has been the case with the UK whose regime was, following reform, financially-oriented, (Defeuilley 1999, p.30-37). On that score, Pugh has recommended a "structured engagement process between the government agencies involved in the electrification planning process and the various stakeholders (consumers, local government agencies, civil society organizations, entrepreneurs, and investors) that can ensure the appropriateness of policies to meet socio-economic development needs and attract necessary investment."[99]

It is crucial to point out that while some of the literatures reviewed[100] discourage subsidized electricity supply, the point of reference and benchmark in such regard has predominantly been the developed State . For developing States and rural societies, however, a subsidy may present the swiftest mechanism through which governments can ensure equitable access to electricity by all. A substantial segment of developing societies is still languishing under inequitable access to electricity and energy poverty, due to issues of affordability *inter alia*. Subsidies which Bhattacharyya defined as "*the difference between the price that would*

[98] Defeuilley, (1999), page 38.
[99] Pugh, G. (2019), page 10.
[100] Bhattacharyya, S.C. (2011), page 320; Berkovitch, I (1996), pages 9-10;

exist in a market in absence of any distortion or market failures and the price faced by consumers at a given time"[101], should therefore, not be discarded *in toto*.

Notwithstanding the fact that electricity was, for most jurisdictions, historically supplied at below-cost prices, there has been a paradigm shift in recent years, with governments recently preferring to charge a fee for the supply of electricity. Such shift in paradigm has been necessitated by what Batley and Larbi termed the "economic rationality of cost recovery"[102] which also fortifies the long-term sustainability of supplying such service. Of late, governments of developing States such as that of Namibia are keen on bearing transmission costs as well as the cost for the local distribution of power with priority to i.e. community health facilities, schools etc., while leaving individual rural households to bear the cost of acquiring distribution transformers and associated components required for connecting such households to the power grid.

Against the foregoing background, including analyses from all earlier sections, the following further lessons are therefore drawn, which developing States can use as a blueprint when considering reforms of their respective electricity markets, to *inter alia*, attract private investment and/or enhance energy efficiencies:

1. For purposes of achieving broad-based inclusive development, developing States need to set an inclusive national energy agenda, demonstrated through an integrated energy supply and regulatory framework; the latter integrated framework should amongst others comprise a comprehensive energy strategy, robust energy policies and effective, enforceable energy laws. The integrated energy supply framework should be realized through a consultative planning process, which should equally entail consideration of additional aspects such as a) off-grid power generation alternatives i.e. renewable energy for remote areas where extension of the grid could prove costly; b) renewable energy opportunities available at the disposal of the particular State in view of finding alternative electricity supply solutions for off-grid areas and areas with limited energy infrastructure; c) fiscal implications of fulfilling PSOs as well as their short-term, medium-term and long-term sustainability; and d) the particular State's institutional capacity to effectively implement PSOs. For the avoidance of doubt, an inclusive energy agenda is one that is mindful of both the social as well as the economic aspects of electricity supply, without

[101] Bhattacharyya, S.C. (2011), page 319.
[102] Batley, R, and Larbi, G. (2004), page 123.

any compulsion to compromise the one above the other. At its core, the inclusive energy agenda needs to reconcile the vices of market reform through liberalisation and those of maintaining public policy objectives within a competitive setting;

2. The formulation of comprehensive, fit-for-purpose energy policies and effective energy laws is crucial. Provision can be made for targeted subsidies and/or the imposition of a nominal PSO levy per customer which is specifically earmarked to support the supply of electricity to underserved areas and consumers. In Montenegro[103] for instance, PSOs are imposed as part of the licence conditions, which presents a good benchmark for other States. Beneficiaries of subsidized power should be identified through a transparent process of vulnerability assessment which is backed by an objective allocation criteria;

3. With respect to remote areas, energy subsidies should, as a matter of priority, be confined to granting access to electricity to the centers rendering critical and essential social services such as emergency services, health care, police, education etc. In so doing, governments would thus be able to assure with priority, the availability and access to basic social services by a particular community;

4. Government interventions aimed at fulfilling PSOs should not be more than what is necessary. Albers[104] and Karova echoed the same sentiments, with Karova maintaining that such measures "should not go beyond what is necessary for ensuring the provision of the public service in question."[105] Interventions should particularly not distort competition and should be assessed against, and be able to pass the requirements of the particular State's competition/antitrust laws;

5. Another significant lesson that can be learnt from the European Community, one of the progenitors of liberalisation, is that community's resolve to elevate public service obligations from politics to the legal realm[106] thereby according PSOs legal protection and legal enforceability. The fulfilment of public policy objectives such as equitable access to a modern supply of electricity for all can be incorporated within the domestic energy laws. Ireland presents a great example in such regard in that Section 39 of the Electricity Regulation Act, 1999 (Ireland) empowers and authorizes the Minister for Public

[103] Karova, R.(2012), page 61.
[104] Albers, M. (2001), pages 941-942.
[105] Karova, R.(2012), page 62-63.
[106] Prosser, T. (2005(, page 205.

Enterprise to impose public service obligations "which may include obligations in relation to security of supply, regularity, quality and price of supplies, environmental protection and use of indigenous energy sources"[107];

It is, however, crucial for policymakers to seek precision when setting the objective and scope of PSOs. Fulfilment of PSOs as part of an inclusive energy supply agenda must particularly be measured against George Doran's SMART[108] criteria and more; in that the identity of the targeted beneficiaries should be precise without ambiguity; there should be continuous monitoring and evaluation of the fulfilment of PSOs; a designate executing agent need to oversee the implementation of PSOs (within the ESI) on government's behalf; within the limit of the levies collected or the available subsidy, there should be precision with respect to which of the PSOs can be fulfilled; and last but not least, PSO levies and such other subsidies should be imposed conscientiously, care being taken not to resort to the use of subsidies *ad infinitum*. There should be both rationality and adaptability in the techniques employed for implementing PSO levies and other energy subsidies, such that as certain beneficiaries become economically enabled to afford the full cost of electricity supply, such headway should have a lessening effect on the combined PSO levies chargeable. The foregoing proposal is consistent with the central view that subsidized energy supply was, is and will never be a sustainable solution to energy service delivery.

Another great lesson can be found within Namibia's rural water supply where historically, the government supplied water to rural communities free of charge at most, through communal water infrastructures. To date, a substantial part of such communal water points are no longer free but are subject to a nominal fee that is coordinated through community representatives. Gradually, households that could afford to reticulate water to their homes paid the connection fee and assumed responsibility for settling their individual monthly water bills, no longer reliant upon subsidized to free communal water. The same formula can easily be replicated within the Electricity Supply Industry with the effect that the supply of subsidized electricity as a PSO does not need to be perpetually so, but should at some stage wean beneficiaries from their dependence on subsidized energy as they become economically empowered and can afford market tariffs in full. Perpetual

[107] Electricity Regulation Act, 1999 (Ireland), available at: http://www.irishstatutebook.ie/eli/1999/act/23/enacted/en/print.html (accessed 23 February 2021).
[108] S.M.A.R.T: Specific; Measurable; Attainable; Realistic; Timely. (Doran, G. T. (1981). There's a S.M.A.R.T. Way to Write Management's Goals and Objectives. Management Review, 70, 35-36.)

PSO levies and associated subsidies imposed upon either the consumer and/or the market and/or borne by the government to support PSOs are unsustainable and would eventually reduce the government's role to the proverbial fate of *Maneuvering the Apostles*. Indeed a World Bank Policy Paper[109] has indicated that subsidies generally waste capital and energy resources on a very large scale and as a result, developing nations are said to use about 20% more electricity than they would if consumers paid the true marginal cost of supply, which in turn discourages investment in new, cleaner technologies and processes that are more energy efficient;

6. Reticulating electricity for all does not necessarily have to translate to free handouts; Ethiopia presents a good benchmark in such regard. Phase 2 of Ethiopia's Electricity Access Rural Expansion Project that was funded by the World Bank, allowed customers to pay for the connection cost over a period of time, thereby supporting "broad-based economic development."[110] That is yet another method of recouping costs when servicing those who cannot afford to pay once-off, the full cost of energy access;

7. Equally important is for the government to have full comprehension of its Electricity Supply Industry's key objective and the extent of government's role in achieving such objective. If the goal is for government to enhance capacity and while at it narrowing the gap between the cost of electricity and the constraints of affordability, government should, through adequate policy and legal instruments, establish modalities for meeting that objective. If subsidies are considered to be a key component to narrowing the energy access gap, State interventions should be limited to what is necessary and government should guard against shouldering the financial burden for electricity supply *ad infinitum*, without an end in sight;

8. Given the propensity of PSOs to distort free market competition, PSOs should only be imposed as an option of last resort and to the extent necessary, and not as the default method of supplying electricity within a given jurisdiction; and

9. In a survey that was conducted in Australia, around 81% of respondents regarded "the cost of supplying energy to people in remote areas"[111] to constitute a community service

[109] Energy Efficiency and Conservation in the Developing World, (1993), page 14.
[110] Barnes, DF., *et al* (2016), page 6.
[111] Baird, K. (2001), page 59.

obligation. Notwithstanding the foregoing, however, the lesson that this dissertation imparts is that the supply of subsidized electricity to remote areas as a PSO should be fulfilled with a cascading approach, with priority for subsidized electricity access first offered to the particular community's schools, hospitals, clinics, and other health centers that cannot afford the full cost of connecting to the grid. Thereafter, reticulation of subsidized power can be cascaded to those who cannot afford, and who have been identified as indigent and un-affording by way of an objective allocation criteria, and subject to available fiscal resources that have been allocated for such purpose. The strategy used by Ethiopia is worth emulating in this regard, enabling individual homes of financially constrained rural and remote consumers to connect to the power grid but allowing them to pay off the connection fee in periodic instalments. This dissertation, however, suggests that such consumers should as far as possible, be required to settle their monthly electricity consumption fees as they fall due.

Notwithstanding similarities of their energy challenges, care should be taken not to regard techniques deployed by a developed State as a one-size-fits-all, which can be adopted and applied as is within a developing nation. The effect and impact may not necessarily be the same. Instead of directly uprooting and transplanting mechanisms from other States as they are, each individual developing State should first consider its energy sector on its own merits, and under its own unique circumstances, before grafting it with mechanisms borrowed from other jurisdictions.

In their quest to bring solutions to electricity access inequalities prevailing within their respective societies, governments of developing States should, in the long-term, respectively aim to establish a stable Electricity Supply Industry which, as far as possible, renders reliable and affordable electricity for all at cost recovery, without the need for PSO levies or such other burdensome subsidies.

7. Conclusion

There is no such thing as a perfect electricity market, however, through an appropriate, integrated energy supply framework, comprising comprehensive policy instruments and legally enforceable energy laws *inter alia*, the market can adequately be configured to be able to sustain both competition and PSOs. To effectuate that, the State, the regulator and other market participants have major roles to play that include enablement, promotion, regulation and compliance.

It is an established fact that the reform of electricity markets by way of either partial or full liberalisation and its ensuing element of competition does have an impact on electricity supply in general and in particular, on obligations such as PSOs, that were fulfilled under the former market organization. The indigent consumer under the new market structure and the average beneficiary under the previous market organization will legitimately expect that access to such services will be affordable or maintained at an affordable cost. On the other hand, energy producers within a competitive market are substantially driven by commercial considerations, thus prone to focusing only where they will derive the most commercial advantage, which may leave certain segments of society without access to electricity. What is undeniable therefore, is the fact that PSOs are introduced within electricity markets and exist therein as the State's *modus* of narrowing the electricity access gap and assuring service delivery for marginalised segments of society.

In the course of overseeing the fulfilment of PSOs within electricity markets, however, it is imperative for governments to strike and maintain a good balance between competing interests within the market, namely the appeal to promote a commercially viable and sustainable electricity market on the one hand and on the other, the appeal to promote and facilitate access to electricity for all, including those who are situated in remote areas. The grandest fallacy of the 21st century would, however, be a situation where PSOs, which are evidently non-commercial and non-competitive aspects, are left up to the *ex mero motu* resolve of market mechanisms within a competitive market.

PSO levies or such other subsidies should judiciously be introduced within competitive electricity markets with a clear aim of neutralizing the negative effects of competition upon the indigent and the remotely located consumer. It is thus important that subsidies that support the fulfilment of PSOs should neither distort competition nor act as a barrier to

market entry or have the effect of unreasonably increasing the cost of doing business. As such, PSO levies or such other subsidies should serve as interim measure and never as government's lasting default method of dealing with electricity supply, because subsidies can only offer "piece-meal solutions that address only a part of the problem."[112] Besides, the prolonged use of levies and subsidies is unsustainable and can eventually lead to the proverbial fate of *Manoeuvring the Apostles* – solving one problem at one end but in so doing creating another elsewhere.

The proven method through which a developing State[113] can accelerate the attainment of SDG 7 is by allowing the vertically integrated State-owned monopoly to make way for competition, so that effectively regulated market forces can take effect. Instead of perpetuating the unsustainable and inefficient vertically integrated monopoly model for public policy reasons, interventions that are less distortive to competition can, under a competitive market, be deployed in order to bring marginalised segments of society within the folds of electricity supply.

What is crystal clear from the foregoing analysis is, however, that a developing State cannot speak of energy prosperity while still maintaining a less inclusive energy supply agenda, and while still facing the stark reality of social stratifications regarding energy access; such that those who can afford the cost of electricity are served while those who cannot are left hanging in the balance. As such, there ought to be an integrated energy framework for the sake of inclusive development and alignment to SDG 7[114]. On the other hand, novel advances in Information Communication Technology tend to exacerbate the energy access challenge, by continuously churning out electrical equipment and electronic devices (including communication devices) at lightning speed, most of which rely on electrical energy to function. Society's demand for and reliance on electricity as a matter of necessity will therefore continue for a long time or at least until such time when a suitable substitute for electricity is found.

The ideal reform process is one that results in a liberalised electricity market that is able to accommodate quality, security, reliability, safety and sustainability of electricity supply while at the same time obliging the fulfilment of public policy objectives, amongst others.

[112] Bhattacharyya, S.C. (2011), page 433.
[113] For UN Member States.
[114] *Ibid.*

From this dissertation's analysis, the conclusion that can be drawn is that indeed a developing State is able to continue fulfilling PSOs within its Electricity Supply Industry following liberalisation. A fit-for-purpose, integrated energy supply framework must, however, be established in order to set out policies, laws and mechanisms for operating a competitive electricity market in tandem with the fulfilment of PSOs. That said, competitive electricity markets can therefore be reconciled with the fulfilment of PSOs and there is a myriad of great lessons to be learnt by developing States from the progenitors of liberalisation; such lessons include methods through which elements of a competitive market are harmonized with PSOs.

In conclusion, if liberalisation were to be a novel virus entering the cells within the symbolic body of electricity markets, public service obligations are certainly the antibodies, safeguarding the indigent, the vulnerable, and the remotely located consumers of electricity. Within such scope, however, PSOs and their constituent subsidies should be imposed conscientiously, serving in the interim as: a means to an end, not an end in themselves.

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