

Regulating the Regulators: Economic Assessment of Philippine Electricity Regulation

Chad Patrick Osorio^{1,2*}

¹Environmental Economics and Natural Resources (ENR) and LAW, Wageningen University, The Netherlands, ²Department of Economics, College of Economics and Management, University of the Philippines Los Baños, Philippine. *Email: chad.osorio@wur.nl

Received: 16 January 2023

Accepted: 06 April 2023

DOI: <https://doi.org/10.32479/ijeep.14213>

ABSTRACT

This paper seeks to analyze the regulatory framework of energy economics in the Philippines. It looks at the historical legal background of these regulations, seeking to understand how different factors contribute to the performance of the energy industry in the Philippines today. The first part provides the recent state of electricity in the Philippines, in contrast to other countries in comparatively the same circumstantial environments but with vastly different payment rates for electricity. The second part delves deeper and discusses its history, tracing the creation of landmark private industries, community cooperatives, and regulatory bodies throughout the century, up to the present day and how the current energy regulatory framework operates. It seeks to isolate the extent of influence on this particular variable that regulatory frameworks exert. Lastly, the final part dissects the Philippine regulatory framework, applying standards and concepts for efficiency in regulation and identifying areas for improvement. It concludes by providing five key recommendations: adopting data-driven regulation; integrating AI analytics; promoting a principle-based regulatory system; improving incentives against corruption and patronage politics, and; increasing consumer education. These steps can provide the backbone of reform that the Philippine regulatory system needs in order to push forward an efficient, human rights-responsive social energy framework for its citizens.

Keywords: Economic Analysis of Law, Regulation, Philippine Electricity Industry

JEL Classifications: K2, P5, N7

1. INTRODUCTION

“When government - in pursuit of good intentions - tries to rearrange the economy, legislate morality, or help special interests, the cost comes in inefficiency, lack of motivation, and loss of freedom. Government should be a referee, not an active player.”

Milton Friedman, 1976 Nobel Prize.

In 1994, there were 68.2 million citizens of the Philippines; by 2019, this number has ballooned to 108.1 million Filipinos. The country’s population growth rate, from 2010 to 2019, stands at 1.6%, ranking one of the highest in the Southeast Asian region. Indeed, it has overtaken the demographic growth of countries

such as China, the United States, and India in the same period (Mercado, 2019).

With booming populations comes greater challenges, and foremost among these is the allocation of natural resources and government services. A combined key aspect of these areas of governance is the efficiency of electricity production, distribution and regulation.

In 2017, the World Bank estimates that nearly 1 billion people in the world have no access to electricity, and of this number, roughly 7.3 million of them live in the Philippines. These individuals and communities are denied opportunities not only for economic development and poverty alleviation, but such mundane things as access to primary health care, communications technology, or

just even having houselights at night (World Bank, 2022). Figure 1 highlights the steady growth of population in the Philippines compared to national access to electricity.

Even ordinary Filipinos who have access to electricity complain about its cost. The 4th quarter of 2016 marked the Philippine power rate as the highest in Southeast Asia (Pacudan, 2018; Rivera, 2017) Household rates are at an all-time high, at Php8.90 per kwh¹, even beating a developed country such as Singapore, whose rates for both commercial and residential consumers fall at Php7.27 per kwh (Rivera, 2017).

This price has seen increase in 2018 at Php10.22 per kwh, ranking Manila Electric Corporation (MERALCO) 2nd highest in Asia in the amount it charges, next to only to Japan at Php12.31 kwh (Lectura, 2018). In fact, the Philippines ranks 16th in the most expensive electricity rates in the world, joining Norway, Sweden, Finland, France and Australia, among many other developed countries (Rivera, 2017). This is astounding considering that the Philippines remains a developing country, with 21.6% of the total population, or 21.97 million Filipinos, living below poverty line (Asian Development Bank, 2019).

The high cost of electricity is problematic in a number of ways. In 2013, an entire province in the Philippines was denied access to electricity after its failure to pay bills, affecting more than 160,000 households, as well as healthcare and commercial activity (Whaley, 2013). Prohibitive electricity prices hamper economic growth, slow the industrialization process and discourage foreign investment in the country (Ahmed, 2017).

Quality of access is also a problem. Despite the ultra-high costs rivaling developed nations, the Philippines continue to suffer from frequent, poorly-explained power outages (Amoguis, 2019). In 2019 alone, extended and unplanned rotational blackouts affected around 40 cities in seven provinces, due to a number of factors, including breakdowns of powerplants and the capacity for the demand exceeding the available supply (Yap, 2019; Austria, 2019). Indeed, the World Bank reports that economic activity in the Philippines is constrained foremost by lack of access to dependable and fairly-priced electricity (Independent Evaluation Group, 2014). Why is this so?

One major factor could be the country's geographical features. The Philippines is archipelagic in nature, composed of 7,641 islands, around two thousand of them habitable. This could play a role in why electricity is both expensive and inaccessible. However, a potent counterargument to this is Indonesia, which also lies in the Southeast Asian region. Refer to Figure 2 for an illustrative comparison of access to electricity between the two countries. Indonesia has around 6,000 habitable islands, yet its population enjoys 98.14% accessibility to electricity (World Bank, 2022), with an average of US\$0.010 per kilowatt hour, versus the Philippine rate of US\$0.019 per kilowatt hour (Global Petrol Prices, 2019), which is nearly double the former's price. It is clear then that in order to understand the inefficiency of the current electricity system of the Philippines, it is important to examine the legal regulatory framework under which the market operates.

1 Data provided in PhP (Philippines Pesos); for reference, 1 Euro = PhP56.44 as of November 2, 2019

1.1. The Evolution of the Philippine Regulatory Framework for Electricity

Understanding the current legal regulatory framework of energy economics and electricity in the Philippines requires tracing its evolution and how it gradually developed to its present state. Doing so provides both the historical background and political evolution of these policies and regulations. This gives a unique insight into the circumstances of their passing, in order to evaluate whether such conditions exist in present day, assess the continued applicability of said regulatory policies, and provide recommendations for amendments in the law in order to properly address the current energy needs of communities in the Philippines.

The first legal framework of electricity in the Philippines was established at the turn of the 20th century. It was in 1892 when the City of Manila, through its Municipal Council, pioneered this revolutionary service provided by the government, when it entered into a 20-year contract with Sociedad Mercantil that the latter would provide electric lighting for various public places (Patalinghug, 2003). Sociedad Mercantil later changed its name to La Electricista, and 13 years later was bought by the newly-established Manila Electric Company (1903), (Cabrera, 1992). The only form of 'government regulation' then was the terms of the service contract agreement under which MERALCO abided.

From this simple system of contractual relations between the government and the supplier evolved an entire, increasingly complex industry. The Philippines, in 1989, was one of the first countries in the Southeast Asian region to allow independent power producers (IPPs), especially in view of its archipelagic status (Nikomborirak and Manachotphong, 2017). With this move, however, the government saw the need to regulate them, seeking to enhance the efficiency of the industry at the same time ensuring that consumers will be protected.

Through the years arose a plethora of laws which governs the electricity industry in the Philippines. These include the Public Service Law (Commonwealth Act No. 146) and its amendments; the 1987 Power Cogeneration Law (E.O. 215); the 1993 Electricity Power Crisis Act (Rep. Act No. 7648); the Build-Operate-Transfer Law (Rep. Act No. 6957) and the 1994 Expanded BOT Law (Rep. Act No. 7718); the Downstream Oil Deregulation Act (Rep. Act No. 8479), and; finally, the Electric Power Industry Reform Act (EPIRA) of 2001 (Rep. Act No. 9136).

The industry is now generally divided into four major segments: electricity generation, transmission, distribution, and supply, each with its own government regulatory agency handling respective related matters. Under the general supervision of the Secretary of the Department of Energy, many of these agencies are authorized to create their own set of rules, regulations and policies governing the legal acts and consequences of the parties within their spheres of governance. Table 1 lists the government agencies and controlled corporations related to the electric industry.

As is apparent in the number of laws to govern the industry, as well as the government agencies and public corporations exercising authority over it, the 2007 Intergovernmental Group of Experts on Competition

Law and Policy in Geneva aptly describes the situation being that “the monopoly state-owned enterprise is subject to much control from the government” (Nikomborirak and Manachotphong, 2017).

2. CHALLENGES TO POWERING UP THE PHILIPPINES

Supporting studies point out that there are other major factors aside from the geography of the Philippines as to why electricity services in the Philippines are expensive, unreliable and ultimately inefficient.

First of all, there is a need to provide for more infrastructures, the current power plants not being able to provide for the electricity needs of the country (Amoguis, 2019). Nearly three-quarters of all the powerplants in the main island of Luzon are 16 years or older, which makes them prone to malfunctions and breakdowns. Instances when these electricity-generating infrastructures are de-rated (that is, their maximum output is decreased in order to prolong their life), plus the fact that energy consumption is growing in both urban and rural regions, lead to inadequate power supply.

The Philippine electricity industry’s legal framework is necessarily intertwined with these technical problems. Due to extended bureaucracy and overbearing regulation, there are a lot of delays in power supply deals, each approved deal requiring ‘359 government signatures, involving 74 agencies and bureaus, covering 43 different licenses and contracts’ (Amoguis, 2019). The procurement process for repairs and upgrades similarly take an extended period of time.

However, despite the tough regulatory system under which the industry operates, the quality of regulation in itself is questionable. For example, a number of agreements with IPPs were shown to be “defective and prejudicial to public interest” upon belated review (Patalinghug, 2003). An example of this would be inequitable contracts with take-or-pay clauses, which required the government to pay for unutilized energy (Nikomborirak and Manachotphong, 2017). In the Philippines, state-owned enterprises suffered tremendously as a result of this, and the coffers of the government would have suffered even more had these contracts not been re-negotiated.

The manner in which the laws themselves have been crafted is also no less problematic. Take the example of cross-ownership. This provision in the EPIRA allows for the cross-ownership of distribution and generation companies of up to 30%, thus enabling the creation of hidden profits when these companies contract with each other (Amoguis, 2019).

Lastly, the Philippines also suffers from tremendous transmission and distribution losses. Also known as system loss, these are charged to consumers, up to 3% of the total bill per month (PSME Advocacy Group, 2019). These include technical losses as well as non-technical ones (pilferage of electricity through illegal connections, for example). This shows that is as much a socio-economic problem as a technical and legal one. Figure 3 compares the transmission and distribution losses of the Philippines with other countries, both developed and developing.

All of these problems point to ineffective and inefficient government regulation, in various aspects of the law: economics and trade, procurement, administrative and even criminal justice. The regulatory policies forwarded by the current system lack the gravitas to address the multi-faceted challenges facing the Philippine electricity industry today. Interestingly, it has been noted that the rationale which serve as the basis for many policies which have been previously adopted and currently in place “could be explained by pure politics” (Nikomborirak and Manachotphong, 2017). But is there a way to improve the status quo?

3. SOLUTIONS TO THE CHALLENGES: IMPROVING REGULATORY EFFICIENCY

In an ideal setting, there would be no need for regulation of the market. After all, the underlying concept of a market is that it is self-correcting, and balances the supply and the demand by itself. However, because the purported goal of many governments is to protect the interests of small consumers from high prices and bad services, as well as the monopolistic position of players unique within the electricity industry, complete market independence is well-nigh impossible (Gülen et al., 2017).

However, as seen in the case of the Philippines, the presence of multiple government regulators has hardly produced the aforementioned goals in the electricity service market. Instead, prices are going up, even as services remain inefficient and the quality of the supply worsens. It is apparent that these regulators have failed their mandate.

Short of calling for their abolition, which is a very improbable event, these regulators must then focus on increasing its organizational efficiency in order to properly fulfil the tasks at hand. This also entails modification of the laws and policies which create them and grant them authority. But what makes an efficient regulator? In other words, what strategies can the government adopt in order to maximize regulatory efficiency?

3.1. Data-Driven Regulation

First, it is important that the regulators’ decisions be informed by the achievement of financial ratios and cost-benefit analyses, looking into the different factors that determine the long-term stability of the industry, as well as the quality of the regulation (Vartanian, 2018). This goes without saying that stricter standards must be imposed on the regulator before decisions can be implemented, in the sense that the rules that it proposes must have strong justification within the context of its execution, supported by well-researched data. While this may seem common sense for both academic and field professionals, it is unfortunate that it is not always true for both regulators and legislators. After all, the basis of so many policies done in the past have never been purely factual at all, but instead have been gravely influenced by the political process (Nikomborirak and Manachotphong, 2017).

Data-driven regulation, especially in the Philippines, is severely lacking. Cost-benefit analyses of policies are often taken in hindsight, which more often than not provide inadequate solutions because the problem has already taken root.

Adopting data-driven regulation makes it necessary then, when forwarding a particular regulatory policy, to keep the following questions in mind:

1. What is the end goal of this regulation?
2. How does this regulatory rule meet the target goal?
3. How is this supported by existing evidence?
4. Are there alternative means which can achieve the same goal but posing lighter burdens and lesser impediments than the current proposal?

3.2. AI Integration

We mention data as a key driver to improving regulatory efficiency. But before data can be used, it must first be gathered. How?

At this point, it is important to note that technology is a main factor in outward shifts of the production possibilities frontier, spurring economic growth. The same is true in the energy sector, as well as the data analytics industry.

For sure, there are many new technologies which can be used to improve the electricity generation, transmission, distribution, and supply process in the country, especially for renewable energy. A separate set of technical articles can be provided for this. However, for the purpose of this paper, we limit the discussion to disruptive technologies which could potentially improve the capacities of the regulators in the Philippines, particularly related to data analytics.

Leading these technologies is Artificial Intelligence.

AI comes in many different forms, integrating various technologies, sources of data, and types of output. One prime example is AI-powered smart grids. It not only improves process efficiency, it can also generate data on which regulations regarding electricity can be derived. Integrating these smart grids for regional power production and distribution can further provide big data, which upon analysis and interpretation can then be the basis for various aspects of regulation, including schedules of pricing (Next Kraftwerke n.d.).

AI-powered smart grids are already being implemented to a certain extent in various jurisdictions, including Canada, Norway and the US (Makala and Bakovic, 2020). This, and various other AI tools, can significantly help in improving the planning and regulation of the electricity industry.

Spearheading the entry of these analytic technologies into the Philippine energy industry, particularly when it comes to funding and adoption, can provide the necessary support to improve regulatory functions of the country’s energy institutions.

3.3. Principle-based Regulatory System

Authority over the industry assists in allowing regulators to ensure that the former operates efficiently (Gülen et al., 2017). However, in many cases, a system of regulation which emphasizes rules more than principles often have a negative effect on the market it seeks to regulate. To wit:

“A myriad of detailed laws and rules — ones that come with their own loopholes, require endless interpretations and remain

static as the economy and events change — often dilute the basic effectiveness that regulation can have” (Gülen et al., 2007).

It becomes even more complicated when the rules set by different regulators over their respective constituents within the same industry are incompatible with each other, or even worse, clash with each other. Not only does this create inefficiency in the growth and development of the industry, it also affects other sectors indirectly (Urahn, 2019). For example, a dispute on conflicting rules brought to the Supreme Court for decision takes a huge

Figure 1: Population in the Philippines (Red) versus Access to Electricity (Blue) (World Bank, 2022)

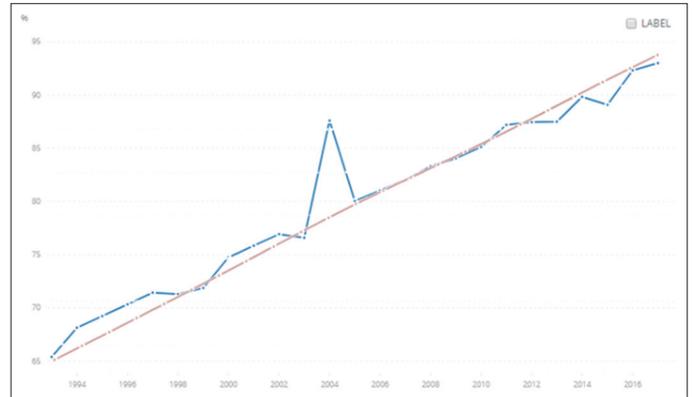


Figure 2: Access to Electricity in Indonesia (Green) and the Philippines (Blue) (World Bank, 2022)

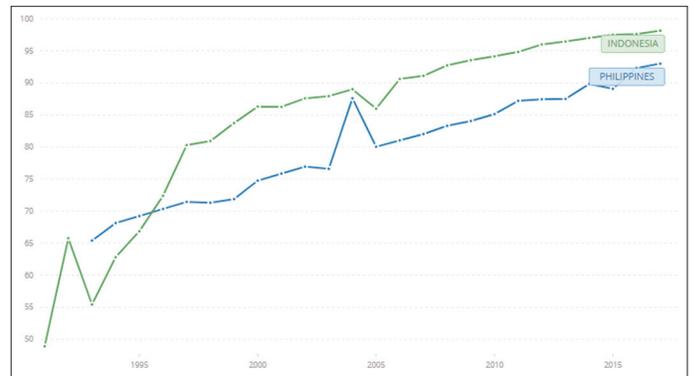


Figure 3: Comparison of Transmission and Distribution in Selected Countries (Asia-Pacific Regional Centre, 2013)

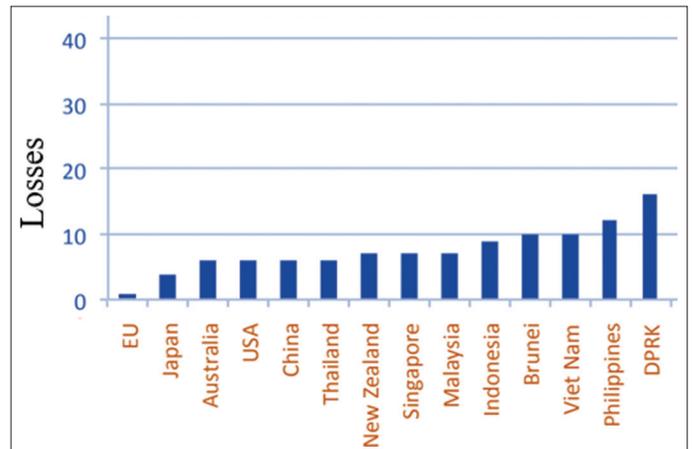


Table 1: Government Agencies and Controlled Corporations Related to the Electric Industry (Department of Energy, 2020)

Department of energy	Energy regulatory commission
National Renewable Energy Board	National Electrification Administration
Renewable Energy Management Bureau	National Grid Corporation of the Philippines
National Power Corporation	National Transmission Corporation
Power Sector Assets & Liabilities Management Corporation	Electric Power Industry Management Bureau

amount of resources of both the parties and the judicial system, which could have been used in industry growth itself, precisely because the regulators have proposed contradictory rules.

In future regulatory reforms, it is important to examine laws and rules which are conflicting, superfluous or otherwise unnecessary, and to weed them out. Keeping in mind a principle-based regulatory system instead of a rules-based system can help level the field of regulation overdose (Gülen et al., 2007). Not only will this promote independence of the actors within the industry and allow market corrections to naturally take place, adopting this perspective also frees regulatory agencies to focus more on resolving the matters at hand, utilizing efficient and economic concepts, rather than relying on sets of rules whose simultaneous application can prove counterproductive in both the short and long run.

3.4. Incentives against Corruption and Patronage Politics

Nikomborirak and Manachotphong, reporting to the Geneva Intergovernmental Group of Experts on Competition Law and Policy on the state of competition in the electricity sector, stated the following:

“[the] regulatory body is needed to mimic competitive market conducts, promote efficiency and ensure fair practices. To achieve such outcomes, a regulatory body should be independent from political influences and understand complex conditions and problems of the electricity sector in each market” (Nikomborirak and Manachotphong, 2017).

Moreover, the traditional problem of economies controlled by regulators, described by authors such as Stigler and Peltzman, is the position of the regulator being a commodity in itself. This leads to situations where such positions can be ‘bought’ and ‘sold’, thereby resulting to a more producer-protected market environment (Peltzman, 1976). Due to the complexity of the electricity industry, especially in the Philippines, the current industrial regulators do not necessarily hanker after political power and the electorate. However, they may be influenced by people who do, a situation which presents more or less the same dilemmas.

Strengthening the system of incentives against patronage politics and corruption improves regulatory efficiency by placing regulatory positions further from the ambit of the market, thereby increasing independence on the part of electricity regulatory officials to enable them to adopt data-driven regulation and a principle-based regulatory system.

3.5. Consumer Education and Social Accountability

As in most areas of governance, transparency and accountability are key factors in improvement. Transparency indicates that the regulatory process is open to all stakeholders, and that the decisions being made are consultative, meaning feedback for improvement is welcome and such are actually taken into account (Gülen et al., 2007).

It is, however, worthy to note that public participation will be of any utility only if “the participating public is able to understand technical background of the issues at hand” (Gülen et al., 2007). This is because of asymmetric information among the stakeholders. For example, industry players tend to have more knowledge about the technical processes than the average consumer. This will then make it easier for the latter to manipulate other stakeholders into accepting inequitable arrangements. It is therefore imperative that all agencies be mandated to forward consumer education, or at least make such information easily available to the public. This empowers citizens to push more meaningful reforms forward, including a better approach to regulation.

From this jumping point, it is important to apply principles of social accountability: constructive engagement and citizen monitoring (Affiliated Network for Social Accountability in East Asia and the Pacific, 2010). This implies that efficient social change needs to result not only from the direct action of governance and regulation, but also and more importantly adopt the concept of methodological individualism: the interference of the market itself, from the perspective of the consumer-citizens first and foremost.

4. CONCLUSION

There is a global movement proposing that access to energy and electricity should be a basic human right (Hughes, 2018). This idea has gained traction in discussions of non-derogation of social and economic rights for everyone, translating to the simple conclusion that solving the question of energy efficiency and sustainability is an essential aspect of the global goal of upholding human rights for all (Walker, 2015).

Regulatory agencies play a huge part in this. After all, “[t]he cost of these regulatory agencies is ultimately carried by the society and it is thus in everyone’s interest to ensure that this regulation is as efficient and effective as possible” (Gülen et al., Forthcoming).

These regulatory agencies need to accomplish, among a myriad other reforms, the following key recommendations: first, to adopt data-driven regulation, which will ensure that all government action have factual, technical and legal bases in order to achieve its goals; second, to integrate disruptive technologies in its data gathering and analytics processes, primarily AI, to assist in its data-driven goals; third, to promote a principles-based regulatory system instead of blindly adhering to a rules-based system; third, to improve incentives against politicking and corruption, which strengthens quality of governance and regulation, and; lastly, to increase consumer education and social accountability. These recommendations may serve as the backbone on which further reforms in both the regulatory and legislative aspects of the electricity industry may be based.

Of course, this paper merely serves as an introduction to the topic, and these measures are all easier said than done (Nikomborirak and Manachotphong 2017). But as is commonly stated in psychotherapy, acceptance is the first step towards healing. In the same way, it is important that the Philippine government first accepts the myriad flaws of its regulatory framework, and from there implement the necessary changes in order to promote and meet the goal of an efficient, effective and human rights-focused electricity service industry.

5. ACKNOWLEDGEMENTS

Special thanks to the mentorship of Fiscal Imelda Mangligot-Hidalgo, former Legal Services Office, National Electrification Administration, and current Department of Justice, Republic of the Philippines. This paper was presented at the 3rd International Conference on Energy and Environmental Economics (ENERCON 2022), Department of Economics, College of Economics and Management, University of the Philippines Los Baños.

REFERENCES

- Affiliated Network for Social Accountability in East Asia and the Pacific. (2010), The Four Pillars of Social Accountability. Available from: <https://www.ansa-eap.net/about-us/who-we-are/the-four-pillars-of-social-accountability>
- Ahmed, S. (2017), Now is the Time to Restructure the Philippines Electricity Sector. Cleveland, OH: Institute for Energy Economics and Financial Analysis.
- Amoguis, M. (2019), Power Underwhelming: Why are there Power Outages? Business World Online. Available from: <https://www.bworldonline.com/power-underwhelming-why-are-there-power-outages>
- Asia-Pacific Regional Centre. (2013), Achieving Sustainable Energy for All in the Asia-Pacific. New York, United States: United Nations Development Programme. Available from: https://www.undp.org/content/dam/rbap/docs/research%20&%20publications/environment_energy/rbap-ee-2013-se4all.pdf
- Asian Development Bank. (2019), Poverty: Philippines. Available from: <https://www.adb.org/countries/philippines/poverty>
- Austria, H. (2019), 11-hour Power Outage to Hit 7 Towns, City in Pangasinan. Philippines: Philippine News Agency. Available from: <https://www.pna.gov.ph/articles/1082486>
- Cabrera, C. (1992), Light Years: The Story of Philippine Rural Electrification. Manila: Kalikasan Press.
- Department of Energy. (2020), DOE Organizational Structure. Available from: <https://www.doe.gov.ph/doe-organizational-structure>
- Global Petrol Prices. (2019), Indonesia Electricity Prices. Available from: https://www.globalpetrolprices.com/Indonesia/electricity_prices
- Gülen, G., Makaryan, R., Volkov, D., Foss, M. (2007), Improving Regulatory Agency Efficiency and Effectiveness: Best Practices, Processes and Organizational Structures. Working Paper, Austin: Bureau of Economic Geology, University of Texas.
- Hughes, M. (2018), Why Access to Energy Should Be a Basic Human Right. New Jersey: Forbes. Available from: <https://www.forbes.com/sites/mikehughes1/2018/12/10/why-access-to-energy-should-be-a-basic-human-right>
- Independent Evaluation Group. (2014), The Big Business of Small Enterprises: Evaluation of the World Bank Group Experience with Targeted Support to Small and Medium-size Enterprises (2006-12). United States: World Bank Group. Available from: <https://openknowledge.worldbank.org/handle/10986/21191>
- Lectura, L. (2018), Average Electricity Price in PHL 2nd Highest in Asia-think Tank. Philippines: Business Mirror. Available from: <https://businessmirror.com.ph/2018/08/07/average-electricity-price-in-phl-2nd-highest-in-asia-think-tank>
- Makala, B., Bakovic, T. (2020), Artificial Intelligence in the Power Sector. United States: International Finance Corporation, World Bank Group. Available from: https://www.ifc.org/wps/wcm/connect/bd3a196d-a88f-45af-bbc6-e0b00790fba8/emcompass_note_81-05-web.pdf?mo d=ajperes&cvid=n72pj5g#:~:text=artificial%20intelligence%2e%20or%20ai%2c%20has,and%20control%20of%20power%20systems
- Mercado, N. (2019), Philippines' 1.6% Annual Population Growth Rate Trumps India, US, China. Philippines: Philippine Daily Inquirer. Available from: <https://newsinfo.inquirer.net/1105954/philippines-1-6-annual-population-growth-rate-trumps-india-us-china>
- Next Kraftwerke., What is Artificial Intelligence in the Energy Industry? Available from: <https://www.next-kraftwerke.com/knowledge/artificial-intelligence>
- Nikomborirak, D., Manachotphong, W. (2017), Electricity Reform in Practice: The Case of Thailand, Malaysia, Indonesia and the Philippines. Geneva: Intergovernmental Group of Experts on Competition Law and Policy.
- Pacudan, R. (2018), The economics of net metering policy in the Philippines. International Energy Journal, 18(3), 283-296.
- Patalinghug, E. (2003), An analysis of the Philippines electric power industry. Philippine Journal of Public Administration, 47(1-4), 80-102.
- Peltzman, S. (1976), Toward a more general theory of regulation. The Journal of Law and Economics, 19(2), 211-240.
- PSME Advocacy Group. (2019), Distribution Utilities Explain 'System Loss'. Philippines: Philippine Society of Mechanical Engineers. Available from: <https://psme.org.ph/news/439667/distribution-utilities-explain-system-loss.htm>
- Rivera, D. (2017), Philippine Electricity Rates Still Highest in Southeast Asia. Philippines: PhilStar Global. Available from: <https://www.philstar.com/business/2017/08/24/1732332/philippine-electricity-rates-still-highest-southeast-asia>
- Urahn, S. (2019), The Role of Efficient Regulation in Building Vibrant Economies. United States: Pew Trusts. Available from: <https://magazine.pewtrusts.org/en/archive/fall-2019/the-role-of-efficient-regulation-in-building-vibrant-economies>
- Vartanian, T.P. (2018), The Key to Efficient Regulation? Less is more. New York: American Banker. Available from: <https://www.americanbanker.com/opinion/the-key-to-efficient-regulation-less-is-more>
- Walker, G. (2015), The Right to Energy: An Analysis of Meaning and Implications. Paris, France: Sciences Po. Available from: <https://www.sciencespo.fr/ceeri/sites/sciencespo.fr/ceeri/files/g.%20walker%20right%20to%20energy%20ceeri%20edf%20oct15.pdf>
- Whaley, F. (2013), Bills Unpaid, Power is Cut to Province in Philippines. New York City: The New York Times. Available from: <https://www.nytimes.com/2013/08/01/world/asia/power-is-cut-to-philippine-province-over-unpaid-bills.html>
- World Bank. (2022), Access to Electricity (Percent of Population, Philippines). Available from: <https://data.worldbank.org/indicator/eg.elc.accs.zs?locations=ph>
- World Bank. (2022), Population, Total-Philippines. Available from: <https://data.worldbank.org/indicator/sp.pop.totl?end=2016&locations=ph&start=1994>
- Yap, C. (2019), Persistent Power Outage in Philippines Triggers Senate Probe. United States: Bloomberg. Available from: <https://www.bloomberg.com/news/articles/2019-04-15/persistent-power-outage-in-philippines-triggers-senate-probe>