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REFORMING NGCP OPERATIONS:  
TOWARDS A SECURE,  
SUSTAINABLE, AND  
**EQUITABLE ENERGY  
FUTURE FOR  
THE PHILIPPINES**



# REFORMING NGCP OPERATIONS: TOWARDS A SECURE, SUSTAINABLE, AND EQUITABLE ENERGY FUTURE FOR THE PHILIPPINES

This paper embarks on the argument that a reliable energy grid entails renewable energy integration, bolstering of national security, and holding the grid operator, National Grid Corporation of the Philippines, accountable to its commitments

Republic Act (RA) No. 9136, commonly referred to as the “Electric Power Industry Reform Act (EPIRA)”, was enacted in 2001, serving as the cornerstone of the regulatory framework for the Philippine energy sector. The law was enacted to ensure affordable and reliable electricity to all power consumers in the country. The EPIRA aims to achieve this by implementing significant reforms including the restructuring and deregulation of the entire power industry and the privatization of most state-owned power generation and transmission assets. These reforms were designed to foster greater competition among industry players and provide consumers with various

choices for their energy needs, while creating a level playing field in the power industry, thereby increasing private sector participation. The law sought to liberalize and unbundle the power sector, promoting competition and resulting in a significant transformation of the country’s power industry. This restructuring divided the industry into different sectors: generation, transmission, distribution, and supply. The transmission players are the National Transmission Corporation (TransCo) and the National Grid Corporation of the Philippines (NGCP).

\* THE VIEWS AND OPINIONS EXPRESSED IN THIS PAPER ARE THOSE OF THE AUTHOR AND DO NOT NECESSARILY REFLECT THOSE OF THE INSTITUTE.



PHILIPPINE ENERGY MIX

According to the Department of Energy (DOE),<sup>1</sup> the Philippines’ total primary energy supply (TPES) stood at 59.2 million tons of oil equivalent (MTOE), marking a 4.59% increase from the 56.6 MTOE recorded in 2020. Fossil fuels continue to dominate the primary energy mix, accounting for 66.5% in 2021, with oil accounting for 29.8%, coal at 31.9%, and natural gas at 4.8%. Renewable energy plays a significant role in TPES, accounting for 33.5% in 2021. This is primarily due to the long-standing use of geothermal (15.5%) and hydro (3.9%) resources for electricity generation and the use of biomass (12.8%) by the industrial and residential sectors.

Total final energy consumption (TFEC) for 2021 amounted to 35.132 MTOE, with the transport sector having the biggest share with 10.983 MTOE (31.26%), followed by the household sector with 10.179 MTOE (28.97%) and the industry sector with 6.819 MTOE (19.41%).<sup>2</sup>

POWER GENERATION

Based on the latest DOE data,<sup>3</sup> coal remains the primary source of electricity generation in the country. In 2022, coal-fired power stations have a total installed generating capacity of 12,428 megawatts (MW) and generated 66,430 gigawatt-hours (GWh) of electricity, which is 60% of the gross power generation in 2022. On the other hand, renewable energy power plants have a total installed generating capacity of 8,264 MW and generate 24,684 GWh of electricity in the same year, making 22% of gross power generation for 2022.

In terms of electricity consumption, households retained the top spot with 35,324 GWh of electricity consumed in 2022. The

TABLE 1 . TOTAL ENERGY AND SELF-SUFFICIENCY LEVEL

(IN KTOE)

	2020	2021		2020	2021
Indigenous Energy	29,676	30,301	Imported Energy	26,902	28,943
Oil	456	392	Oil	15,997	17,261
Natural Gas	3,288	2,820	Coal	10,710	11,499
Coal	6,836	7,414	Bioethanol	194	183
Hydro	1,790	2,287	Total Energy	56,577	59,243
Geothermal	9,249	9,184	Renewable Energy (RE)	19,290	19,857
Biomass	7,563	7,611	Clean Energy (RE + Natural Gas)	22,578	22,677
Wind	88	109	Self-Sufficiency (%)	52.5	51.1
Solar	118	1206			
Biodiesel	131	157			
Bioethanol	155	200			

Note: kTOE – thousand tons of oil equivalent

SOURCE: KEY ENERGY STATISTICS: 2021, DEPARTMENT OF ENERGY (2022)

TABLE 2 . INSTALLED GENERATING CAPACITY, BY PLANT TYPE

(IN MW)

	2020	2021	2022
Coal	10,944	11,669	12,428
Oil-based	4,237	3,847	3,834
Natural Gas	3,453	3,453	3,732
Renewable Energy	7,617	7,914	8,264
Geothermal	1,928	1,928	1,952
Hydro	3,779	3,752	3,745
Biomass	447	489	611
Solar	1,019	1,317	1,530
Wind	443	427	427
TOTAL INSTALLED CAPACITY	26,250	26,882	28,258

SOURCE: 2022 POWER STATISTICS: SUMMARY, DEPARTMENT OF ENERGY (2023)

industrial sector followed with 28,844 GWh of electricity consumed. Meanwhile, commercial establishments consumed 24,294 GWh of electricity, which increased significantly coming from the pandemic period (2020-2021) when many establishments were forced to close due to strict lockdowns imposed by the national and local governments.<sup>4</sup>

ENVIRONMENTAL IMPACT

On March 1, 2017, the Philippines ratified the climate treaty known as the Paris Agreement and its associated Nationally Determined Contribution (NDC), declaring the national government’s intention to reduce greenhouse gas (GHG) emissions (CO<sub>2</sub> equivalent) by 70% relative to the country’s business-as-usual (BAU) scenario until 2030. The energy, transport, waste, forestry, and industry sectors were all identified as sectors that can contribute to emission reductions. The commitment itself is subject to the availability of financial resources including capacity building and technology development and transfer.<sup>4</sup>

Notwithstanding ratification, there remains considerable uncertainty around how these commitments will be achieved particularly given that continued economic development relies on substantial increases in power generation capacity. The DOE has officially expressed its “conditional concurrence” to the country’s commitments under the Paris Agreement. However, under the current targets for the future energy mix of 70% “baseload” capacity, 20% “mid-merit” capacity, and 10% “peaking” capacity (70–20–10), coal generation, as the current least-cost form of baseload generation, may remain a priority which could potentially impede progress toward targeted emission reductions.<sup>6</sup>

The DOE estimates that under the Philippine Energy Plan BAU scenario, GHG emissions from fossil fuels used in energy production will increase by approximately 5.5% annually through 2040. This

TABLE 3 . GROSS POWER GENERATION, BY PLANT TYPE  
(IN GWH)

PHILIPPINES	2020	2021	2022	% Share – 2022
Coal	58,176	62,052	66,430	59.7%
Oil-based	2,474	1,616	2,519	2.26%
Natural Gas	19,497	18,675	17,884	16.04%
Renewable Energy	21,609	23,771	24,684	22.13%
Geothermal	10,757	10,681	10,425	9.35%
Hydro	7,192	9,185	10,085	9.04%
Biomass	1,261	1,165	1,322	1.19%
Solar	1,373	1,470	1,822	1.63%
Wind	1,026	1,270	1,030	0.92%
<b>TOTAL</b>	<b>101,756</b>	<b>106,115</b>	<b>111,516</b>	<b>100%</b>
Self-sufficiency level (%)	47	45		

SOURCE: 2022 POWER STATISTICS: SUMMARY, DEPARTMENT OF ENERGY (2023)

TABLE 4 . ELECTRICITY CONSUMPTION, BY SECTOR  
(IN GWH)

	2020	2021	2022	% Share - 2022
Households	34,292	34,981	35,324	31.68%
Services/Commercial	20,727	21,119	24,294	21.79%
Industrial	25,566	27,623	28,844	25.87%
Others*	2,658	3,695	2,871	2.57%
Utilities Own Use	8,771	8,729	9,490	8.51%
Power Losses	9,742	9,968	10,693	9.59%
<b>TOTAL</b>	<b>101,756</b>	<b>106,115</b>	<b>111,516</b>	<b>100%</b>

\*Others include Transport and Agriculture

SOURCE: 2022 POWER STATISTICS: ELECTRICITY SALES AND CONSUMPTION PER GRID, BY SECTOR, DEPARTMENT OF ENERGY (2023)

will result in annual emissions of 396.9 million metric tons of CO<sub>2</sub> in 2040. Coal will be responsible for 52.4% of the anticipated emissions, oil-based fuels for 42.4%, and natural gas for 5.2%. Over half of the GHG emissions will come from power generation. Transport will contribute 28.7% of emissions, and the industry sector will produce 13.2% of total emissions.<sup>7</sup>

In April 2021, the Philippines submitted its NDC that aims to reduce the country’s 2030 GHG emissions by 75% as an aspirational target compared with the BAU forecast. This comprises a 72.29% conditional commitment and 2.71% unconditional commitment for the sectors of agriculture, waste industry, transport, and energy. This commitment is referenced against a projected BAU cumulative economy-wide emission of 3,340.3 MtCO<sub>2</sub>e for the same period.<sup>8</sup>

RENEWABLE ENERGY POTENTIAL TARGETS AND SOURCES

Southeast Asia is one of the world’s fastest-growing economic regions, where economic growth hinges on a country’s power generation capacity.

Coal currently fuels the Philippines’ rapidly growing economy,<sup>9</sup> which grew by 7.6% in 2022.<sup>10</sup> As the country aims to achieve a steady gross domestic product (GDP) growth of 6-7% in 2023 and 6.5-8% in 2024-2028,<sup>11</sup> there is a potential to steeply increase fossil fuel emissions unless large increases in renewable power generation are realized.

Republic Act 9513, or the Renewable Energy Act of 2008, was enacted to reaffirm the government’s commitment to accelerate the utilization of renewable energy resources in the country. This law seeks to establish the foundation for “the accelerated development and advancement of renewable energy resources, and the development of a strategic program to increase its utilization”.

TABLE 5 . GHG EMISSION, BY SECTOR AND ACTIVITY  
(IN MtCO<sub>2</sub>e)

	2020	2021	GR
Industry	11.32	12.50	10.4%
Transport	28.16	31.54	12.0%
Others*	11.35	12.13	6.8%
Electricity Generation	70.95	73.88	4.1%
Energy**	0.79	0.40	-49.2%
TOTAL	122.6	130.4	6.4%

Notes: MtCO<sub>2</sub>e - Million tons of CO<sub>2</sub> equivalent  
\*includes Households, Services and Agriculture Sectors  
\*\*includes Oil refining, Electricity and other Energy sector own use and losses

SOURCE: KEY ENERGY STATISTICS, DEPARTMENT OF ENERGY (2021)

TABLE 6 . GHG EMISSION, BY FUEL TYPE  
(IN MtCO<sub>2</sub>e)

	2020	2021	GR
Liquid Fossils (Oil)	46.26	49.81	7.7%
Solid Fossils (Coal)	68.63	74.05	7.9%
Gaseous Fossil (Natural Gas)	7.69	6.60	-14.2%
TOTAL	122.6	130.4	6.4%

Notes: MtCO<sub>2</sub>e – Million tons of CO<sub>2</sub> equivalent  
SOURCE: KEY ENERGY STATISTICS, DEPARTMENT OF ENERGY (2021)

Amidst a global movement to transition into renewable energy to mitigate climate change, the Philippines aspires to position itself as the leading renewable energy producer in Southeast Asia, surpassing Vietnam, as it sets out to implement an ambitious yet aggressive renewable energy roadmap that will result in a 1500% boost in combined solar and wind power by 2030.<sup>12</sup>

Data from Global Energy Monitor (GEM) shows that the Philippines currently ranks a distant second in the region in combined solar<sup>13</sup> and wind<sup>14</sup> power generation, with 2,192 MW of installed capacity, compared to Vietnam’s 16,946 MW. By 2030, however, the Philippines plans to add 17,462 MW of solar capacity<sup>15</sup> and 7,847 MW of wind power,<sup>16</sup> positioning itself as the top green power producer in Southeast Asia.

The country is targeting a 35% and 50% renewable energy share in the power generation mix by 2030 and 2040, respectively, as outlined in the Philippine Energy Plan 2020-2040,<sup>17</sup> more specifically, in the National Renewable Energy Program 2020-2040.<sup>18</sup> Among the reasons behind this move is the looming depletion of the Malampaya gas field, which is expected to run dry within five years.

During the latter part of 2022, DOE issued Circular No. 2022-11-0034 which amended the implementing rules and regulations (IRR) of the Renewable Energy Act, particularly removing the foreign investment cap. The 1987 Philippine Constitution explicitly prohibits 100% foreign ownership of businesses. With this amendment, foreign investors and companies can now take part in the exploration, development, and utilization of renewable energy in the country.<sup>19</sup>

The combination of new ownership rules and strong energy demand growth is expected to lure growing interest from global firms engaged in renewable energy construction, which includes nine (9) Chinese firms that committed a total of USD13.76 billion in investments in the sector.<sup>20</sup>

TABLE 7 . SUMMARY OF RE PROJECTS UNDER THE RE ACT OF 2008  
(AS OF JUNE 2023)

Resources	No. of RE Projects		Potential Capacity (MW)		Installed Capacity (MW)	
	Commercial	Own-use	Commercial	Own-use	Commercial	Own-use
Hydropower	429	1	12,494.10	-	1,160.656	-
Ocean Energy	9	-	34.000	-	-	-
Geothermal	36	-	996.600	-	1,931.665	-
Wind	194	1	75,040.880	-	442.900	0.010
Solar	310	31	24,777.560	8.286	1,375.870	6.432
Biomass*	58	18	212.879	-	575.1799	182.871
Sub -Total	1036	51	113,556.06	8.286	5,486.89	189.813
Grand Total	1087		113,564.35		5,676.70	

SOURCE: INCLUDING 3 NON POWER FACILITIES (STEAM); DEPARTMENT OF ENERGY (2023)

TABLE 8 . PHILIPPINE TRANSMISSION GRID PROFILE: TRANSMISSION LINES  
(IN CIRCUIT-KILOMETERS)

	2019	2020	2021
Luzon	9,227	9,396	9,499
Visayas	5,299	5,299	5,379
Mindanao	5,553	5,824	5,855
TOTAL PHILIPPINES	20,079	20,519	20,732

SOURCE: KEY ENERGY STATISTICS: 2021, DEPARTMENT OF ENERGY (2022)

TABLE 9 . PHILIPPINE TRANSMISSION GRID PROFILE: SUBSTATION CAPACITY  
(IN MILLION VOLT-AMPERES)

	2019	2020	2021
Luzon	28,021	27,955	29,976
Visayas	4,884	4,487	5,754
Mindanao	3,531	5,331	6,141
TOTAL PHILIPPINES	36,436	37,773	41,871

SOURCE: KEY ENERGY STATISTICS: 2021, DEPARTMENT OF ENERGY (2022)

According to the DOE, there are currently 1,087 renewable energy projects in the country under the Renewable Energy Act.<sup>21</sup>

TRANSMISSION IN FOCUS

The TransCo was formed under the EPIRA and operated and managed the transmission network before the NGCP was awarded the concession in 2008. TransCo remains the legal owner of the underlying assets. In recent years, one of its principal roles has been to act as the Feed-in Tariff Allowance (FiT-All) fund administrator for the disbursement of funds to renewable energy developers with eligible projects.<sup>22</sup>

ESTABLISHMENT OF NGCP

Privatization was a pivotal component of the EPIRA-driven reform process that redefined power generation as no longer being a public utility operation. By the end of 2013, the power sector in the Philippines had become one of the most extensively privatized power sectors in the region.<sup>24</sup>

In March 2003, TransCo commenced its operations to assume the electrical transmission function of the National Power Corporation (Napocor). TransCo maintains and manages the entire power transmission system that connects power generators to electric distribution utilities across the country. EPIRA mandated the privatization of TransCo in open competitive bidding either via an outright sale or a concession agreement. In 2008, the Philippine government initiated the privatization process for the transmission sector. TransCo issued a concession for the operation, maintenance, and expansion of the country’s power grid through a public bidding process, while ownership of all transmission assets would remain with TransCo.

TABLE 10 . PHILIPPINE TRANSMISSION GRID PROFILE: CAPACITY MIX, INSTALLED AND DEPENDABLE CAPACITY  
(AS OF JUNE 2023)<sup>23</sup>

Power Plant Type / Fuel Source / RE Source	Capacity (MW)		Percentage Share (%)	
	Installed	Dependable	Installed	Dependable
Conventional Power Plants	20,039	17,535	70.8	71
Coal	12,473	11,394	44.1	46.1
Oil-based	3,834	2,860	13.5	11.6
Natural Gas	3,732	3,281	13.2	13.3
RE-Based Power Plants	8,259	7,174	29.2	29.0
Geothermal	1,952	1,763	6.9	7.1
Hydro	3,770	3,469	13.3	14.0
Biomass	579	380	2.0	1.5
Solar	1,531	1,151	5.4	4.7
Wind	427	412	1.5	1.7
TOTAL	28,297	24,711	100.0	100.0
GRID				
LUZON	19,758	17,413	69.8	70.5
VISAYAS	3,972	3,335	14.0	13.5
MINDANAO	4,567	3,962	16.1	16.0
TOTAL	28,297	24,711	100.0	100.0

Note: Excluding off-grid generators  
Installed Capacity - nameplate capacity; full-load continuous gross capacity of a unit under specified conditions, as calculated from the electric generator nameplate based on the rated power factor.  
Dependable Capacity - maximum capacity when modified for ambient limitations for a specified period of time, such as a month or a season

SOURCE: DEPARTMENT OF ENERGY (2023)

The consortium consisting of the State Grid Corporation of China (SGCC), Monte Oro Grid Resources Corporation led by Henry Sy, Jr., and Calaca High Power Corporation led by Robert Coyiuto, Jr. emerged as the winning bidder. SGCC holds a 40% stake in the National Grid Corporation of the Philippines (NGCP), while the remaining 60% is owned by the two Filipino companies.

In January 2009, the NGCP was officially established. The concession deal was worth USD3.95 billion, with a franchise good for 50 years.<sup>25</sup>

NGCP’S PROFITABILITY ISSUES

One of the concerns raised against NGCP is the high return on investment for its stockholders. Since 2009, NGCP has earned PHP286 billion, of which, PHP208 billion has been distributed as dividends to shareholders.<sup>27</sup>

In a Senate hearing last May, NGCP faced scrutiny over its “excessive” dividends for shareholders. The grid operator said that the bulk (75% to 99%) of its net income earned in 2014, 2015, 2017, and 2019 were paid out as dividends to shareholders.

Senator Raffy Tulfo, chair of the Senate Committee on Energy, questioned this practice, suggesting that these funds should have been used for power projects instead. The power grid operator explained that the dividends are not only from the net income of the current year but also from the retained earnings.<sup>28</sup>

The Senate also questioned the grid operator for charging consumers even when projects have not yet commenced. The Energy Regulatory Commission (ERC) noted that the NGCP has 72 delayed projects across the country, which includes six backbone

TABLE 11 . NGCP BOARD OF DIRECTORS

Name	Profile
Mr. Zhu Guangchao	Vice Chief Engineer and Director General of the International Cooperation Department of SGCC, Vice-Chairman of Redes Energéticas Nacionais, SGPS, S.A. in Lisbon, Portugal, and Board Director of Hong Kong Electric Company. He previously served as the Managing Director, President, and CEO of the State Grid International Development Limited, Deputy Director General of SGCC's Philippine Office, Deputy Director General of SGCC's Finance Department, President of Tai'an Power Supply Company, and Vice President of Rizhao Power Supply Company.
Mr. Henry Sy, Jr.	Chairman and CEO of SM Development Corporation, Chairman of SM Prime Holdings, Inc., Vice-Chairman of SM Investments Corporation, and Chairman of Pico de Loro Beach & Country Club.
Mr. Robert Coyiuto, Jr.	Currently the Chairman of the Board and CEO of Prudential Guarantee and Assurance, Inc., Chairman of the Board of PGA Cars, Inc., Vice-Chairman of First Life Financial Co., Inc., President of Oriental Petroleum & Minerals Corporation, Chairman of the Board and CEO of PGA Sompo Japan Insurance, Inc., and Director of Canon (Philippines), Inc.
Mr. Jose Pardo	Chairman of the Philippine Stock Exchange, Philippine Savings Bank, Securities Clearing Corporation of the Philippines, Bank of Commerce, Philippine Seven Corporation, Employers Confederation of the Philippines' Council of Business Leaders, and Philippine Chamber of Commerce and Industry's Council of Business Leaders. He also sits as a Director for ZNN Radio Veritas, JG Summit Holdings, Inc., Synergy Grid and Development Phils., Inc., Monte Oro Grid Resources Corporation, Araneta Hotels, Inc., League One Finance and Leasing Corporation, and Del Monte Philippines, Inc. He is a prominent figure in the public sector having held top posts at various agencies, most notably the Department of Finance and Department of Trade & Industry.
Dr. Francis Chua	Chairman Emeritus of the Philippine Chamber of Commerce and Industry and Founding Chairman of the International Chamber of Commerce - Philippines. He is also a member of the Board of Directors of Negros Navigation, 2GO, and Bank of Commerce. Dr. Chua is the Consul General (ad honorem) of the Honorary Consulate General of Peru in Manila since 2006.
Mr. Yao Yousheng	Currently the Chief Representative of the SGCC Philippine Office. Since 2007, he is mainly involved in the international operations of SGCC's power companies overseas. As a senior economist with a doctor's degree in technical economics and management, his previous work experiences covered the areas of insurance, trust, finance, audit, and corporate administration.
Mr. Wang Lijin	Graduated from Xi'an University of Technology in 1995 with a bachelor's degree in engineering, majoring in Power System and Automation, and is a professorate senior engineer. An expert in power grid operation management, and quality and safety engineering. He is also engaged in technical and professional management system construction, operation, and implementation of power auxiliary facilities. He has a rich experience in emergency system construction, capacity improvement, and is adept at handling natural disaster scenarios such as typhoons, earthquakes, debris flow, and snow.
Mr. Liu Xinhua	Holds two master's degrees: a master's degree in engineering and an Executive Master's Degree in Business Administration. He is also one of the top-notchers in China's Certified Public Accountant (CPA) board examination. He is a certified Financial Risk Manager (FRM®) and holds a Sustainability and Climate Risk (SCR®) certificate, both from the Global Association of Risk Professionals (GARP) in New Jersey, USA. His work experiences cover the areas of accounting, finance, audit, risk management, and corporate administration.
Mr. Anthony Almeda	Chairman and CEO of ALALMEDA Land, Inc., Chairman of OneSQM Inc., as well as Chairman and CEO of Chainblock, Inc. He also sits as a Director for ALALMEDA Energy Inc., Miguelunda Educational Corporation, and Pacifica 21 Holdings, Inc.
Atty. Paul Sagayo, Jr.	Partner at Sagayo Law Offices

SOURCE: CORPORATE PROFILE, NGCP WEBSITE (N.D.)<sup>26</sup>



projects. But Senator Sherwin Gatchalian flagged that despite these projects being delayed, they are already part of the transmission charge being collected by the power grid operator under its approved interim maximum annual revenue in 2020.<sup>29</sup>

NGCP apologized for the delays, attributing them to both internal and external delays. Department of Energy (DOE) Undersecretary Sharon Garin said that the delays in the implementation of NGCP projects are “without the approval” of the ERC or the DOE.

Due to the concession agreement between the NGCP and TransCo and the grid operator’s congressional franchise, the DOE said that it “cannot do anything” and that the ERC can only impose a Php50 million fine per violation. These concerns will be considered for the filing of amendments to the EPIRA law, according to the Senate panel.<sup>30</sup>

The Senate hearing was prompted by reports of intermittent power supply as many parts of the country experienced power outages. DOE Secretary Raphael Lotilla, meanwhile, cites the series of brownouts in pushing for a performance audit of the NGCP.<sup>31</sup> The DOE noted that the NGCP has not undergone a performance audit since its establishment in 2009. According to Sec. Lotilla, the grid operator had previously “resisted” contractual performance reviews.

A consumer group called on President Ferdinand Marcos Jr. to “reprimand” NGCP and “revisit” the franchise agreement to address its shortcomings. Roland Vibal, the national coordinator for Kuryente.org, emphasized that “the power outage we experienced in the sweltering heat of the country’s dry season is not an accident but a result of NGCP’s failure to fulfill its obligations as a private corporation responsible for operating, managing, and ensuring that the country’s grid provides reliable, sufficient, and safe electricity.”<sup>32</sup>

Lawmakers threatened to revoke the government franchise if these

concerns were not addressed due to various issues and problems regarding NGCP’s performance.<sup>33</sup>

Meanwhile, the grid operator said in a statement that it has invested Php300 billion in grid improvement projects since 2009.<sup>34</sup> According to the NGCP, this investment is higher than the Php33 billion spent by TransCo in the five years before the privatization of the transmission network.<sup>35</sup>

The grid operator disclosed that a total of 3,729 circuit kilometers of transmission lines, 28 new substations, and an additional 31,190 MVA of transformer capacity have been installed in the past 14 years. From 2009 to 2022, it has completed 56 projects which include the following:

- the Mariveles-Hermosa 500kV transmission line, expanding the transmission capacity in the area to accommodate more than 2,500MW of generation from the Bataan Peninsula;
- the Luzon Voltage Improvement Projects Stages 1, 3, and 4;
- the San Jose-Quezon 230kV Transmission Line 3 project;
- the Pagbilao 500kV Extra High Voltage Substation, which accommodated the connection of around 1,420MW from power plants in Quezon province;
- the Cebu-Negros-Panay 230kV Backbone Stage 1, interconnecting Cebu, Negros, and Panay for faster and more efficient power sharing;
- the Ormoc-Babatongon 138kV Transmission Line, reinforcing power transmission delivery in the Leyte and Samar provinces;
- the Calong Calong-Toledo-Colon-Cebu 137kV Transmission Line, constructed to create an N-1 system between Negros and Panay grids;

- the Bohol 138kV Backbone Line, which solved the overloading condition and provided a more stable and reliable transmission network in Bohol;
- the Maramag-Bunawan 230kV Transmission Line, the first 230kV transmission line in the region;
- the Villanueva-Maramag 230kV Transmission Line, linking northern and southern Mindanao;
- the Aurora-Polanco 138kV Transmission Line, which mitigated voltage fluctuations in Zamboanga del Norte to Misamis Occidental; and
- the PHP52 billion Mindanao-Visayas Interconnection Project (MVIP), a landmark undertaking connecting the power grids of Visayas and Mindanao.<sup>36</sup>

## TRANSMISSION PROJECTS IN THE PIPELINE

The company is set to complete more projects in 2023, particularly critical projects, such as the Hermosa-San Jose 500kV Transmission Line Project, Cebu-Negros-Panay Stage 3 Backbone Project, Nabas-Caticlan-Boracay Transmission Line Project, Cebu-Bohol Interconnection Project, and commence new projects approved by the ERC, such as the Batangas-Mindoro Interconnection Project.<sup>37</sup> (see Table 12)

## NATIONAL ENERGY SECURITY CONCERNS

Energy security should undoubtedly take center stage as the primary focus of the NGCP. In a rapidly evolving energy landscape, it’s essential to pivot towards a forward-looking approach that ensures the resilience and dependability of the nation’s power supply.

TABLE 12 . ONGOING TRANSMISSION PROJECTS OF THE NGCP<sup>38</sup>

Luzon	Visayas	Mindanao
1. Ambuklao–Binga 230 kV Transmission Line Project	1. Cebu–Bohol 230 kV Interconnection Project	1. Balo-i–Kauswagan–Aurora 230 kV Transmission Line Project
2. Binga–San Manuel 230 kV Transmission Line Project Stage 2	2. Cebu–Lapu–Lapu 138 kV Transmission Line Project	2. Butuan–Placer 138 kV Transmission Line Project
3. Luzon Substation Expansion Project 4	3. Visayas Substation Reliability Project 2	3. Kabacan 138 kV Substation Project
4. Balsik (Hermosa)–San Jose 500 kV Transmission Line Project	4. Sta. Rita–Quinapondan 69 kV Transmission Line Project	4. Tacurong–Kalamansig 69 kV Transmission Line Project
5. Bataan 230 kV Reinforcement Project Stage 2	5. Cebu–Negros–Panay Stage 1	5. Mindanao 230 kV Transmission Backbone Project
6. North Luzon Substation Upgrading Project Stage 1	6. Cebu–Negros–Panay Stage 2	6. Mindanao Substation Rehabilitation Project, Stage 1
7. North Luzon Substation Upgrading Project Stage 2	7. Cebu–Negros–Panay Stage 3	7. Mindanao Substation Upgrading Project, Stage 1
8. Binga–San Manuel 230 kV Transmission Line Project Stage 1	8. Naga (Visayas) Substation Upgrading Project	8. Mindanao Substation Upgrading Project, Stage 2
9. Clark–Mabiga 69 kV Transmission Line Project	9. Panay–Guimaras 138 kV Interconnection Project	9. Sultan Kudarat Substation Capacitor Bank
10. Luzon Voltage Improvement Project 3	10. Permanent Restoration of Colon–Samboan 138 kV Lines 1 & 2 Affected by Landslide	10. Mindanao–Visayas Interconnection Project
11. Luzon Voltage Improvement Project 4	11. San Carlos–Guihulngan 69 kV Transmission Line Project	11. Nabas–Caticlan–Boracay 138 kV Transmission Line Project
12. Mariveles (Alas-asin)–Balsik (Hermosa) 500 kV Transmission Line Project	12. Tagbilaran 69 kV Substation Project	12. Panitan–Nabas 138 kV Transmission Line 2 Project
13. Pinili 230 kV Substation	13. Visayas Substation Reliability Project 1	
14. Relocation of Hermosa–Duhat 230 kV Transmission Line Project	14. Visayas Substation Upgrading Project, Stage 1	
15. San Manuel–Nagsaag 230 kV Transmission Line Project	15. Visayas Voltage Improvement Project 1	
16. San Simon 230 kV Substation	16. Agus 2 Switchyard Upgrading	
17. Tuguegarao–Lal-lo (Magapit) 230 kV Transmission Line Project		
18. Western 500 kV Transmission Line Project (Hermosa–Castillejos 500 kV Transmission Line)		
19. Calamba 230 kV Substation Project		
20. Dasmariñas 500 kV Substation Expansion Project		
21. Salvacion (APEC)–Sto. Domingo 69 kV Transmission Line Project		
22. Eastern Albay 69 kV Transmission Line Project, Stage 2		
23. Las Piñas (Zapote) Substation Expansion Project		
24. Luzon Substation Reliability Project 1		
25. Pagbilao 500 kV Substation Project		
26. Tower Structure Upgrading of Bicol Transmission Facilities		
27. San Jose–Angat 115 kV Transmission Line Project		
28. San Jose–Quezon 230 kV Transmission Line Project		
29. South Luzon Substation Upgrading Project Stage 1		
30. South Luzon Substation Upgrading Project Stage 2		
31. Tiwi Substation Upgrading Project		
32. Tuy 500 kV Substation Project		
33. Lumban EHV–Bay 230 kV Transmission Line Upgrading Project		
34. Antipolo 230 kV Substation Project		
35. Manila (Navotas) 230 kV Substation Project		
36. Marilao 500 kV Substation Project		
37. Relocation Works for the Affected Transmission Facilities by Metro Manila Skyway Stage 3 Project, Section 3 & 4, Along Araneta Avenue, Quezon City		
38. Taguig 500 kV Substation Project		

SOURCE: DEPARTMENT OF ENERGY (2023)

To achieve this, NGCP must strategically upgrade the power grid infrastructure. These upgrades should prioritize the seamless integration of renewable energy sources into the grid. This is paramount in light of the global shift towards clean and sustainable energy alternatives. By facilitating the integration of renewables, NGCP not only contributes to environmental sustainability but also reinforces the energy security of the country.

Furthermore, these infrastructure enhancements should be geared towards the reliability and affordability of the country's power supply as this impacts the daily lives of the Filipino people. By strengthening our transmission network, NGCP can reduce the likelihood of power outages and ensure that consumers have access to a stable electricity supply. Moreover, this approach should also ensure that energy costs are reasonable and competitive in the face of rising global energy demands.

In March 2023, the NGCP signed a memorandum of understanding with the National Intelligence Coordinating Agency (NICA) to prevent cyberattacks and safeguard the nation's energy infrastructure. Senator Risa Hontiveros urged for the review and evaluation of the performance of NGCP and its capacity to ensure its commitments to upgrading the power grid infrastructure to achieve national energy security.<sup>39</sup>

When asked by lawmakers about its operations, the NGCP maintained that despite SGCC's 40% stake in the grid company, it doesn't equate to control of the company. NGCP said that no Chinese holds any executive or managing positions except for the four directors on the board.<sup>40</sup> In a separate statement,<sup>41</sup> the NGCP, explaining further the role of their Chinese partners, explained that the SGCC's stake in the grid company was a requirement for the franchise, as they needed a technical partner to operate with.

Due to the various issues surrounding NGCP's performance, Malacañang said that the Government will take back control of NGCP "if necessary."<sup>42</sup> TransCo, on the other hand, said that they are ready to take over the operations of power transmission lines should the franchise be revoked.<sup>43</sup>

## CHINA'S ENERGY INVESTMENTS

SGCC is a Chinese state-owned power company and has investments in other countries. SGCC is among the companies involved in Chinese overseas investments under the Belt and Road Initiative (BRI).

According to the SGCC,<sup>44</sup> as of June 2020, it has investments in nine countries and regions, including Brazil, the Philippines, Portugal, Australia, Italy, Greece, Oman, Chile, and Hong Kong, with overseas investments of USD23.2 billion and overseas equity capital of approximately USD65 billion. Moreover, it has set up offices and branches (subsidiaries) in more than 20 countries and regions, including Ethiopia, Brazil, Pakistan, Egypt, Turkey, and Lao PDR, and expanded power transmission and transformation business to nearly 40 countries in Asia, Africa and Latin America, covering UHV (ultra-high-voltage), national backbone power grid, DC transmission, medium and low voltage distribution networks, operation and maintenance and others with success of financing projects in the form of BOOT (build-own-operate-transfer) and PPP (public-private partnership).

## ENERGY SECURITY AND ACHIEVING 100% ELECTRIFICATION

Providing a stable, nationwide power supply has long been a challenge for the Philippines since it is comprised of over 7,600 islands. Access to stable electricity is still scarce in remote areas.

One opportunity for overcoming supply gaps lies in the modernization of small island power systems through the adoption of renewable sources, which will lead to cheaper and cleaner power.

Affordability, accessibility, and reliability are the three aspects of energy security that the government plans to address under the Philippine Development Plan 2023-2028.<sup>45</sup>

The NGCP has a primary role, as the nation's transmission utility, to contribute towards this end.

NGCP said that ancillary services are needed to ensure a reliable power supply. Ancillary services are support services needed to sustain the transmission capacity and energy that are essential in maintaining the power quality, reliability, and security of the grid.<sup>46</sup> Meanwhile, the NGCP warned of intermittent power interruptions after the ERC denied the grid operator's request for a month-on-month extension on ancillary services agreements, while the competitive bidding process was being undertaken.<sup>47</sup>

## NGCP'S RELATIONSHIP WITH DISTRIBUTION UTILITIES

There are currently 152 distribution utilities (DUs) according to the DOE.<sup>48</sup> Classification of electric utilities in the Philippines:

- EC-CDA – Electric utilities under the Cooperative Development Authority



- LGUOU – Local government unit-owned utilities
- MPC – Multi-purpose cooperatives
- NEA-EC – Electric utilities under the National Electrification Administration
- PIOUS – Private investor-owned utilities or privately-/independently-owned utilities
- SPUG-EC – Small power utilities group
- SPUG-EC CDA – SPUGs under the Cooperative Development Authority

Distribution utilities in Iloilo City blamed the NGCP for the massive unscheduled power interruption in Panay Island and Guimaras earlier this year. They blamed the problems in NGCP's transmission system as the cause for the massive power outages in the region, saying that electricity from power plants flows through NGCP's transmission lines to the DUs. They added that if one DU experiences a problem, it is isolated by a breaker to protect the rest of the system.<sup>49</sup>

The grid operator, on the other hand, clarified that “many factors came into play” which caused the grid alerts and incidents that occurred. “In the case of Panay Island, NGCP's protection systems, which were communicated and coordinated with its grid-connected customers from both the generation and distribution sides, functioned as intended. ...only the consumers connected to the line that tripped should have been disengaged from the grid. It was unfortunate that a power plant disengaged from the transmission system unexpectedly. This response from the generating unit is both unexpected and undesirable. The resulting undervoltage and underfrequency was severe and unrecoverable and was the direct cause of the tripping of other power plants connected to the system, and ultimately, the Panay sub-grid collapse,” NGCP said.<sup>50</sup>

## NGCP'S ROLE IN RENEWABLE ENERGY ADOPTION

Modernizing the country's energy grid infrastructure to better integrate renewable energy technologies and sourcing options is crucial to ensuring energy efficiency, sustainability, and resilience.

The NGCP said that it is committed to working towards achieving the government's move for cleaner energy through greater renewable energy integration into the power supply mix. The grid operator said that its Transmission Development Plan (TDP) is compliant with the DOE's renewable energy target of 50% renewable energy integrated with the grid by 2040.<sup>51</sup>

While the projected increase in the utilization of renewable energy resources is encouraging, the variable nature of renewable energy resources poses new challenges for grid planning and operation. It requires strengthening the transmission network through expansion and upgrades. The development of strong backbones in Luzon, the Visayas, and Mindanao Grids, as well as significant stretches of interconnection lines through submarine cables, are the minimum requirements to ensure energy transmission from various potential renewable energy development zones to the loads throughout the Philippines. Operational flexibility is also crucial in addressing the additional net-load variability brought by VRE. Advanced forecasting to reduce the uncertainty of VRE and the deployment of more flexible and fast-acting energy storage systems for ancillary service applications are among the options to improve operational flexibility. NGCP said it is already considering renewable energy developments in grid planning and operation. Further studies are being conducted to understand the potential impacts of high penetrations of renewable energy and to identify solutions that will address renewable energy integration challenges, ensuring the grid's readiness for the realization of renewable energy goals in the future.<sup>52</sup>

Moreover, NGCP urged the ERC and the DOE to “revisit policies to accelerate the expansion of transmission lines and ensure that the power grid would be capable of integrating high levels of variable renewable energy”. “External limitations, including regulatory caps on capital expenditures, protracted permitting processes by the local government units, and difficult rights-of-way procurement, have proven to be the primary roadblocks to project completion,” NGCP said in a statement.<sup>53</sup>

However, Energy Secretary Raphael Lotilla blamed the slow progress of 68 grid connection projects under NGCP for the low investor turnout for the DOE's second Green Energy Auction Program in June.<sup>54</sup>

No less than President Ferdinand Marcos Jr. called out the NGCP for its failure to deliver on its interconnection projects, particularly “the vital Mindanao-Visayas and the Cebu-Negros-Panay interconnections.”

These challenges have also prompted the President to declare that the government is “conducting a performance review” of NGCP.

With more particularity, the renewables sector has concerns about the delay in NGCP's review of more than 160 renewable projects, in which a timetable of twelve to fifteen months has been set to complete the process.<sup>55</sup>

Modernizing the energy grid is essential for the country to achieve energy security, improving the electricity supply chain and ensuring efficient power delivery. But an important step towards achieving this outcome is cooperation among the various stakeholders and being adaptable to the changing technology and energy landscape.

## RECOMMENDATIONS

Critical issues surrounding the Philippine energy grid – from reliability and affordability to national security – necessitate tighter regulatory policies to enforce compliance with existing policies, particularly regarding RE integration.

A well-regulated and compliant energy grid is essential for the stability, reliability, and sustainability of a country's energy supply. To achieve this, the following measures can be considered: (1) strengthen and ensure independence of regulatory agencies; (2) develop clear and specific standards and performance metrics for energy companies to follow; (3) implement regular auditing and reporting; (4) introduce harsher penalties for non-compliance; (5) promote transparency by making compliance data publicly accessible; (6) encourage collaboration between regulatory agencies, industry stakeholders, and consumer groups; and (7) invest in education and training.

It's crucial to strike a balance between regulation and industry growth, ensuring that regulations are fair, and reasonable, and do not stifle innovation and investment in the energy sector. Regular assessments and updates of regulations can help adapt to changing circumstances and technological advancements while maintaining a strong regulatory framework.

Amid concerns surrounding NGCP's financial operations, it is crucial for them to prioritize upgrading the country's transmission system and working towards achieving national energy security. The substantial amounts paid out as dividends should be considered and reinvested in the power grid infrastructure. Doing so would make a positive contribution to protecting consumers' welfare and addressing power reliability and affordability concerns in the country.

Lawmakers have pointed out that NGCP benefits from 'pass-through' provisions, which allow certain transmission-related costs to be passed on to electricity consumers. However, delays in the implementation of transmission projects have raised concerns as NGCP collects fees for projects that have not yet commenced. It is important to recognize that while pass-through provisions aid NGCP in recovering costs and maintaining grid stability, they can also potentially impact consumers through changes in electricity rates. The regulatory process should strike a balance between ensuring the financial health of energy companies and safeguarding consumer interests.

To address this issue, the ERC should tighten oversight on the completion of these critical infrastructure projects. This would strengthen the country's electricity value chain and prevent higher electricity costs for consumers. Public transparency, oversight, and accountability are vital for making pass-through provisions fair and effective in the Philippine energy sector.

Considering the extent of the company's project portfolio for 2023, there is a growing need for transparency regarding these initiatives. The general public, particularly those directly impacted by these projects and those who stand to benefit from them, should have access to timely updates on their status. Transparent communication can shed light on whether the projects are progressing as planned or encountering challenges. This transparency is vital for fostering trust, enabling informed decision-making, and ensuring that the projects align with the best interests of the local communities and the broader public. By providing clear and open information, stakeholders can establish a constructive dialogue with NGCP. This dialogue can, in turn, lead to efficient and successful project outcomes, resulting in an improved service for the public.

The President is correct to order a thorough performance audit of NGCP. The audit should ensure that more funds are channeled towards improving the country's power infrastructure, which would, in turn, address issues such as delayed projects and regular power outages.

Considering the concerns raised by Energy Secretary Raphael Lotilla about NGCP resisting contractual reviews, regular performance audits should be undertaken. This will ensure that the grid operator continually meets its obligations, fostering public trust in its operations.

Additionally, to address technology concerns and potential vulnerabilities, the ERC should engage neutral third-party tech firms for an unbiased assessment of our grid's technological infrastructure.

The government can engage international experts or consultants to conduct independent audits and assessments of the power grid's security. These audits may be conducted with the involvement of relevant government agencies and experts in the field of cybersecurity, physical security, and critical infrastructure protection. Key components of the national security audit may include, among others: (1) identification of threats and vulnerabilities, (2) critical infrastructure assessment, (3) cybersecurity assessment, (4) physical security assessment, (5) emergency response and preparedness, (6) counterterrorism and counterintelligence measures, (7) information sharing and collaboration, (8) resilience and continuity of operations, and (9) public awareness and education.

It is crucial to prioritize the resolution of technological issues and the mitigation of vulnerabilities in the Philippine energy grid to maintain the security and dependability of the country's power

infrastructure. To accomplish this, the ERC should adopt a proactive stance by enlisting neutral third-party technology firms to conduct an unbiased evaluation of the grid's technological framework. This independent assessment will serve as a central element in pinpointing vulnerabilities, potential threats, and areas necessitating enhancement within the grid's technological infrastructure, a critical measure in fortifying defenses against possible cyberattacks or system breakdowns. This evaluation would also serve as a comprehensive audit of the grid's digital and communication systems, data protection measures, cybersecurity protocols, and overall technological architecture. It aims to uncover potential weaknesses, vulnerabilities, or areas that require improvement within the grid's technological framework.

On the other hand, DOE and ERC should consider revising existing policies to facilitate growth in the renewable sector. By easing expansion processes for transmission lines and addressing bottlenecks like protracted permitting, we can expedite project completion. This alignment with renewable energy goals will not only serve our environment but also ensure a sustainable energy future.

Lastly, the importance of timely project execution cannot be overstated. Given President Marcos Jr.'s concerns regarding NGCP's interconnection projects, it is imperative to impose strict timelines and oversee the process to ensure its completion within specified periods. Such measures will undoubtedly boost investor confidence and contribute significantly to meeting the nation's energy demands.

## CONCLUSION

A reliable energy grid is the lifeblood of the nation's economic and national security, as well as vital to the health and safety of all Filipinos. As the Philippines forges its path toward a stable and secure energy future, vigilance, oversight, and proactive measures concerning NGCP are crucial. By emphasizing renewable energy integration, bolstering national security, and holding the grid operator accountable to its commitments, the nation can hope for a more reliable, sustainable, and secure energy landscape for all Filipinos.



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ABOUT

Atty. Terry L. Ridon



served as Chair and Chief Executive Officer of the Philippine Presidential Commission for the Urban Poor and Congressman in the House of Representatives. He completed Harvard Business School's General Management Program, studied public policy at the Harvard Kennedy School and law at the University of the Philippines.

Mark Ezekiel G. Quinto



is a writer, researcher, and community organizer. He is currently a Policy and Advocacy Officer for youth group Kabataan Party-list, covering more than three congressional terms. His policy and research interests include youth empowerment, workers' rights, poverty reduction, social protection, good governance, and human rights.



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Philippines 1226

V 8892.1751  
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