CASE STUDY: CHINA'S ROLE IN GLOBAL GRID MODERNIZATION

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FINANCIAL FUTURES CENTER

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INTRODUCTION

The State Grid of China (SGCC) is one of the world's largest grid-focused utilities, with revenue in 2019 of over CNY 2.7 trillion (~USD 390 billion), and operations that span beyond the borders of China to Brazil, the Philippines, Portugal, Australia, Italy, Greece, Hong Kong, Oman, and Chile. As such, SGCC has a globally significant role in grid modernization to maximize distributed renewable energy sources that benefit power systems and consumers by improving reliability, efficiency, flexibility, and resilience. These factors, in turn, enhance electricity cost-competitiveness and help create jobs.

HISTORY OF SGCC IN THE CONTEXT OF POWER SECTOR DEVELOPMENT IN CHINA

The Electrical Power Law of the People's Republic of China was enacted in 1995 and established State Power Corporation of China (SPCC), a single state-owned enterprise in charge of providing electricity across regions and managing the state grid system. It followed the vertically integrated industry model and owned most of China's power generation industry and almost all the power grids across China. The National Energy Commission (NEC), the National Development and Reform Commission (NDRC), and the National Renewable Energy Administration (NEA) are the three main government-mandated energy regulators.

The National Energy Commission established in 2010 is responsible for devising national energy development strategy, examining major problems on energy security and energy development, coordinating major issues concerning domestic energy exploration, and managing international energy cooperation.

Macroeconomic regulation is the National Development and Reform Commission's responsibility. It has approval powers for major projects on behalf of the State Council and has authority over the generation price, the transmission and distribution price, and the retail price of electricity.

The National Energy Administration has regulatory power over coal, oil, natural gas, electricity, renewables, and other energy sources. It oversees drafting plans for energy development, examining and approving power projects, and supervises the operation of power markets.

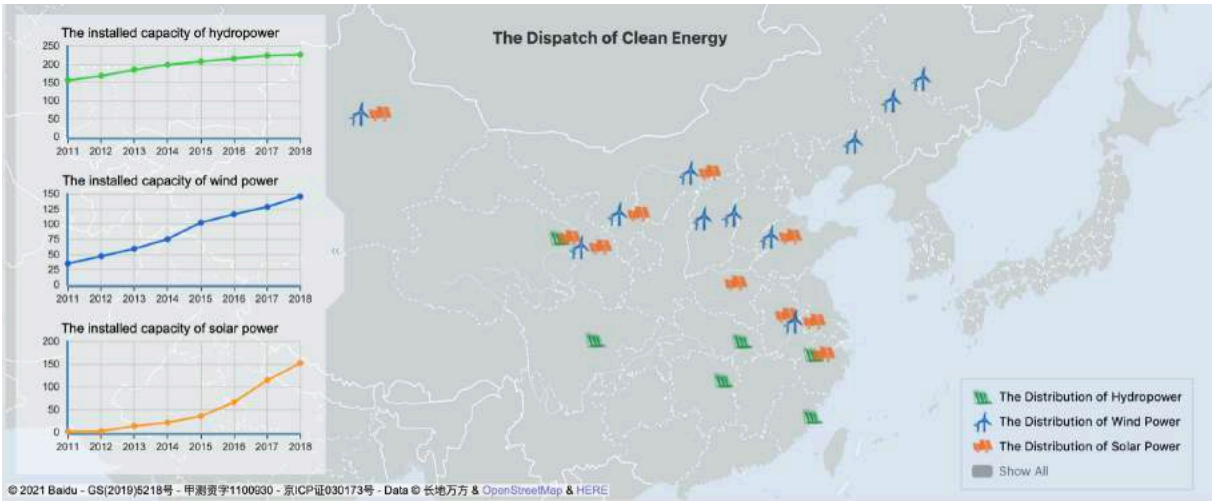
SPCC manages power generation and power grids in China. Power generation consists of five independent electricity providers set up in 2002 and other generation providers from local government corporations, the quasi-private sector, and private companies, while power grids are managed and operated by three key state-owned companies: State Grid Corporation of China (SGCC), China South Power

Grid (CSG), and the Inner Mongolia Group. SGCC was established in 2002, approved by China's State Council.

CHINA'S DOMESTIC VISION FOR STRONG AND SMART GRIDS

To address the need for more and sustainable power, the 12th Five-Year Plan (FYP) for National Economic and Social Development emphasized the need for a smart grid as a key factor in its Strategic Emerging Industries program. The central government said that along with a smart grid, a strong grid was also necessary to achieve the power sector's goals.

This year may prove to be a tipping point for the Chinese power market, with the solar power industry expected to add another 60 gigawatts (GW) of capacity. This is the first year of the 14th Five-Year Plan, the aims of which include increasing renewable energy in the generation mix. This continues the country's transition to green energy resources after the previous plan added five times more solar power connections than the 12th FYP, which focused on the necessity of a smart grid. Feed-in-tariff mechanisms have greatly influenced the continuous increase in solar



[1] These industries include new-generation information technology, bioindustry, high-end equipment manufacturing, new materials, new energy, intelligent and new energy vehicles, energy conservation and environmental protection, and the digital creative industry.

Source: http://www.sgcc.com.cn/html/sgcc_main_en/index.shtml

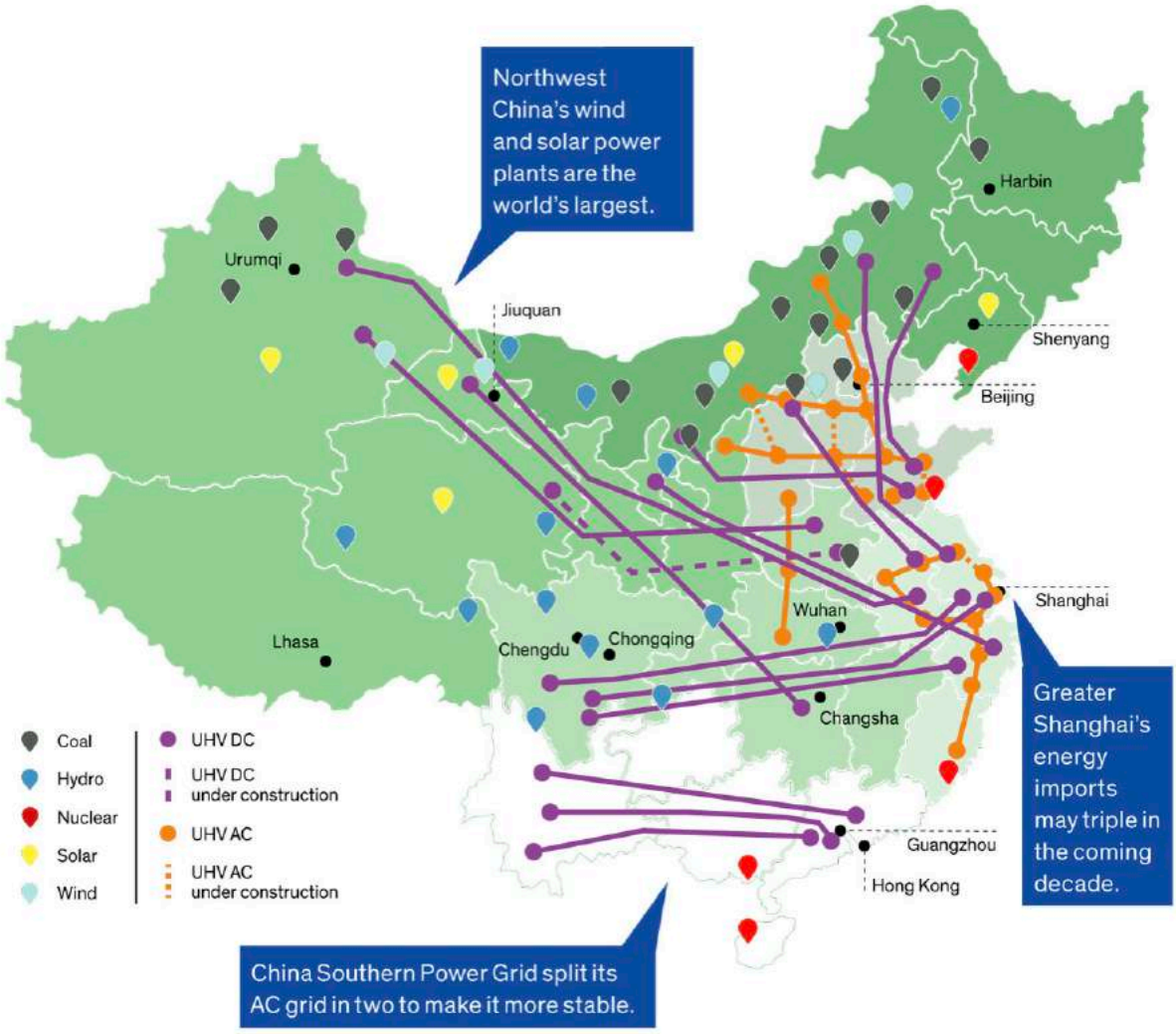
installations, which is consistent with President Xi Jinping's pledge of carbon neutrality by 2050.

Strong in this context means that the power grid should have robust networks capable of transmitting large amounts of electricity over a long distance safely and stably. The Guidelines on Promoting Development of [a] Smart Grid expressly state that the centralized long-distance transmission and localized distributed generation should be developed simultaneously. The grid must be tough enough to connect China's north and west regions where the RE generation is located to the east where generated power is mostly consumed.

The smart grid is intended to penetrate every aspect of grid improvement. It points toward the establishment of policy mechanisms to accelerate the deployment of smart grid technologies and equipment and to promote micro-grids, smart grid communities, smart buildings, and smart meters. Additionally, the government urges the adoption of peak and off-peak electricity prices, demand-side management, innovation in energy technology, and energy efficiency.

A strong and smart grid would enable China to produce power using the underutilized land in the west, while still minimizing the systems loss during transmission using long, high-voltage DC lines and maximizing the opportunity to use variable renewable energy sources.

The smarter grid is now able to support the stronger grid, and vice versa, which means that the components of the electric grid, including transmission wires, substations and transformers, distribution wires and others, can now transmit and distribute electricity more efficiently and reliably, with issues reported immediately for attention.



Long, high-voltage DC lines were built in order to reduce system loss since the power flows more uniformly than alternating current.

Source: https://spectrum.ieee.org/energy/the-smarter-grid/chinas-ambitious-plan-to-build-the-worlds-biggest-supergrid

SGCC OPERATIONAL UPDATE

China's transmission grids are divided geographically, with the State Grid Corporation of China (SGCC) controlling 88% of the system and serving more than a billion people. To adapt to demand for more and sustainable power, SGCC issued in June 2010 its own proprietary equipment standards for 22 critical smart grid technology solutions.

Because Chinese manufacturers' equipment is standardized, they are now able to replicate strong and smart grid systems overseas. SGCC has made significant overseas investments and has participated in infrastructure projects worldwide.

The National Grid Corporation of the Philippines (NGCP) was created when the Monte Oro Grid Resources Corp., Calaca High Power Corporation and State Grid Corporation of China formed a consortium to bid for the transmission franchise in accordance with the Electric Power Industry Privatization Act of 2001 (EPIRA). It outbid a group of investors led by San Miguel Corporation and won the TransCo franchise in 2007 to operate, manage, and expand electricity transmission.

TABLE 1. SGCC OVERSEAS INVESTMENTS

Country	2020 RE %	Start	Stake	Company	Gen	Trans	Distr	Sales
Brazil	84.23%	2017	54.64%	CPFL, Brazil	✓		✓	
Brazil		2010		State Grid Brazil Holdings SA		✓		
Philippines	21.86%	2009	40%	National Grid Corporation of the Philippines		✓		
Portugal	58.83%	2012	25%	REN		✓✓	✓	
Australia	24.87%	2012	41.1%	ElectraNet		✓	✓✓	
Australia		2014	60%	SGSPAA (Jemena)		✓	✓✓	
Australia		2014	19.9%	SP AusNet		✓		
Italy	43.17%	2014	35%	CDP RETI		✓		
Greece	35.91%	2017	24%	ADMIE		✓✓	✓	

Oman	0.01%	2019	49%	Oman Electricity Transmission Co.			
Chile	48.65%	2020	100%	Chilquinta Energia		✓	
Hong Kong	0.29%	2014	15%	HK Electric Investments Ltd	✓	✓	✓

✓ – power ✓ – gas ✓ – renewable energy

Source: http://www.sgcc.com.cn/html/sgcc_main_en/col2017112817/column_2017112817_1.shtml

TABLE 2. SGCC OVERSEAS INFRASTRUCTURE PROJECTS

Country	Project Name	Period
Brazil	Belo Monte Hydropower UHV DC Transmission Project - Phase 1 - Building 2,518km of ±800kV UHV DC power transmission lines - Converting stations at the two ends and related facilities	2015-2019
Brazil	Teles Pires Hydropower Transmission Project - Phase 2 - Building 1,280km of ±230kV power transmission lines - Building one 230kV substation - Expanding four 500kV substations	2016-2020
Poland	General contractor of 6 mid and high-voltage substations - 220kV and 400kV	2013-2022
Egypt	EETC 500kV Backbone Grid Upgrade and Transmission Project	2016-2018
Ethiopia	Ethiopia GDHA 500kV Power Transmission and Transformation Project	2014-2015
Ethiopia / Kenya	Ethiopia-Kenya ±500kV DC Power Transmission and Grid Interconnection Project	2016-2017
Ethiopia	Ethiopia Mid and Low Voltage Power Grid Transformation and Expansion Project	2016-2017
Ethiopia	Power Transmission and Transformation Project for Light Rail Transit System in Ethiopia	2014-2015

Pakistan	Matiari-Lahore ±660kV DC Transmission Project - China Electric Power Equipment and Technology Ltd invested and implemented the project in the form of BOOT with an operation period of 25 years - 2 new converting stations and 878km of power transmission lines with a capacity of 4GW will be built	27 months
Myanmar	North Myanmar, Kachin State 230kV Backbone Grid Interconnection Project - Building and expanding one 230kV substation - Building 300km of power transmission lines	2016-2019
Laos	Vieng Chan 500kV Grid Ring Project - Expanding two 500kV substations and two 230kV substations - Building 100km of 500kV/230kV power transmission lines	36 months

Source: http://www.sgcc.com.cn/html/sgcc_main_en/col2017112821/column_2017112821_1.shtml

NATIONAL GRID CORPORATION OF THE PHILIPPINES

The National Grid Corporation of the Philippines (NGCP) is one of the many companies co-owned by SGCC. Interestingly, among the other countries where SGCC has invested, the Philippines has the lowest share of renewable energy, excluding city-state Hong Kong and oil exporter Oman. Furthermore, the Philippines is the only country with a downward trend in renewable energy since SGCC's involvement.

While NGCP is not at fault for the decrease in the country's total RE generation, the grid operator has the power to make it easier for renewable energy technologies to infiltrate the grid. Just as SGCC did in China, building a smarter grid would allow better balancing of the system to accommodate more flexible power sources.

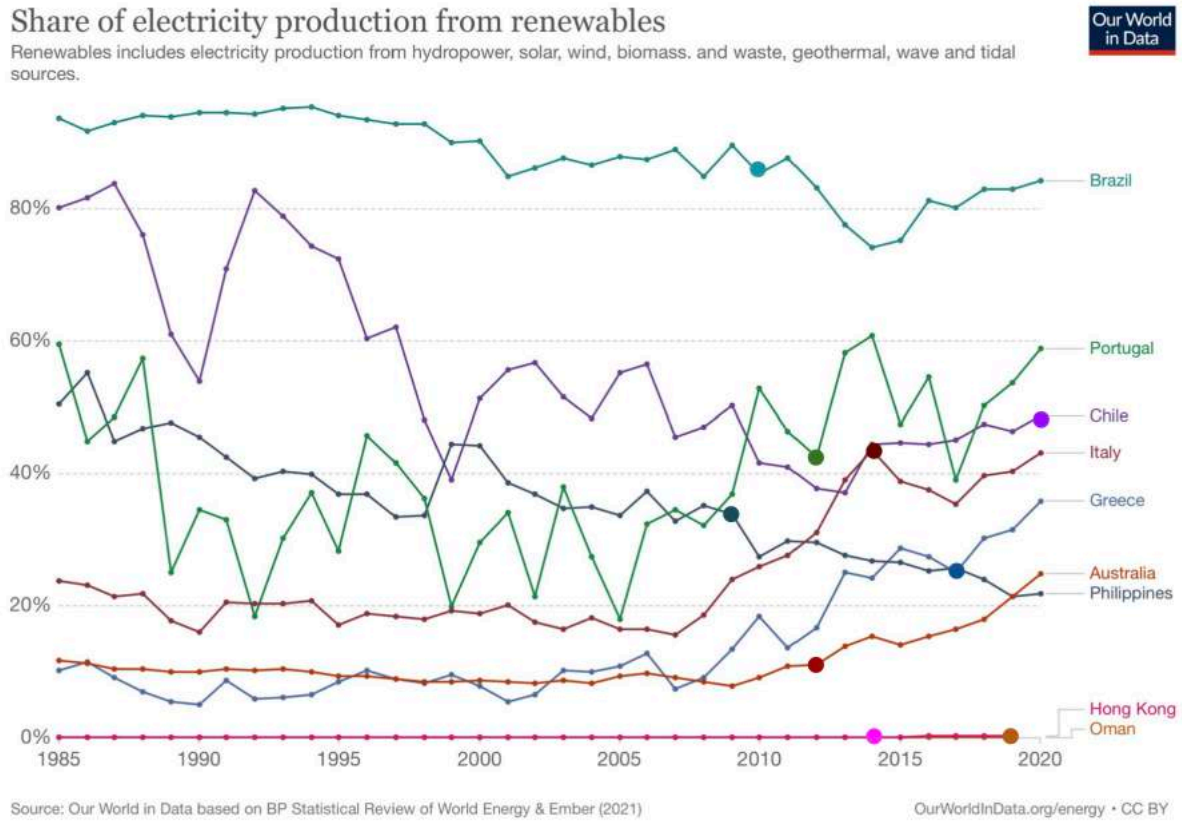
EPIRA privatized the power sector of the Philippines and the National Transmission Corporation (TransCo) was created to acquire National Power Corporation's transmission assets, while the Power Sector Assets and Liabilities Management Corporation (PSALM) took ownership of all existing generation assets of the National Power Corporation (NPC). Other than the generation assets, PSALM was also tasked to initiate TransCo's privatization and "award, in open competitive bidding, the transmission facilities, including grid interconnections and ancillary services to a qualified party either through an outright sale or a concession contract."

After the NGCP consortium won the bid in 2007, RA 9511, or the act granting the National Grid Corporation of the Philippines a franchise to be the transmission provider in the country, was passed. The act allowed NGCP a 50-year franchise to operate and maintain the country's transmission system.

The concession agreement of NGCP with TransCo and PSALM was signed in February 2008. As part of the agreement, NGCP had to pay PSALM a total of $3.95 billion (P196.6 billion in current pesos) for the concession rights, with 25% to be paid immediately, and the remaining 75% payable in 40 semi-annual installments. In January 2009, NGCP paid PSALM $987.5 million as initial payment, and the remaining $2.962 billion will have a fixed rate of PHP42.65 per dollar.

The remaining 75% of the total $3.95 billion concession rights will be paid in 40 semi-annual payments. Based on the cumulative dividends of NGCP to its shareholders, they were able to recoup the initial P46 billion investment in their 4th year of operation. By 2015, the shareholders were able to get double their initial investments. (See Annex A for more details).

The law that granted NGCP the franchise in 2008 mandated the network operator to make a public offering of at least 20% of its outstanding capital within 10 years from the start of operation.

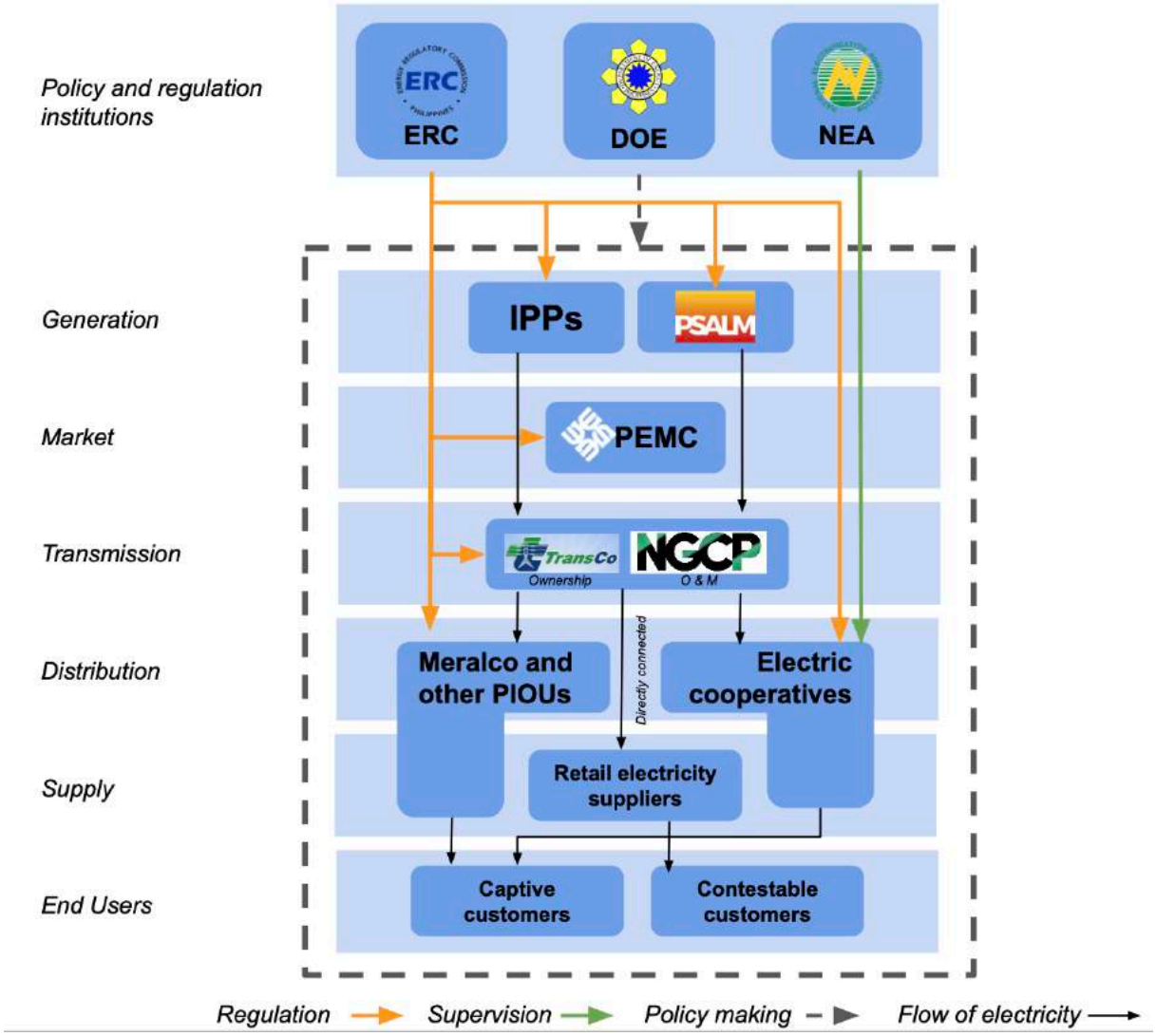


Source: http://www.ourworldindata.org – with added markers on the years SGCC invested in each country

The National Transmission Corporation (TransCo) reorganized in 2009 with its primary role is "to ensure the concessionaire's (NGCP) compliance with the terms and conditions of the Concession Contract and the policies and guidelines of the Department of Energy."

In November 2018, NGCP applied for an extension of its IPO. TransCo and PSALM appealed, claiming that ERC does not have a jurisdiction to grant NGCP extension. NGCP used its dispute with TransCo and PSALM filed with the International Chamber of Commerce in Singapore dated August 2017 as the reason to delay its IPO. News reports in early 2017 said TransCo claimed that NGCP violated the concession agreement by installing fiber telecommunication facilities along the grid. According to TransCo, NGCP should have first asked for its permission to avoid billions of pesos in infrastructure costs that would eventually be passed down to consumers.

NGCP had previously committed to have an IPO in 2019 as mandated by its concessionaire agreement, but because of the delays, according to TransCo, NGCP has deprived the Filipino people and the government at least 4 billion pesos in dividends per year. This assumes that the 20% of the company available for the IPO would be bought only by Filipino entities.



Source: Asian Development Bank

In 2020, NGCP asked the government to extend the deadline for the share sale, but Senator Sherwin Gatchalian, head of the Senate Energy Committee, denied the request. NGCP is trying to delay its IPO because of the current market decline caused by the pandemic, but the government insists that NGCP cannot delay a requirement mandated by its franchise.

The process took three years, and in March 2021, ERC finally denied NGCP's request to delay their IPO and gave the transmission operator six months to finish the filing of their application with the Securities and Exchange Commission. Early this year plans for NGCP's IPO were announced. It is expected to raise as much as $1.5 billion, which would be the Philippines' biggest IPO. (See Annex B for more details.)

It should also be taken into consideration that it is possible for foreigners to buy Philippine stocks through brokers. With the IPO in the horizon, SGCC's shares could be diluted to 32% or could go as high as 50%, if they are able to purchase all 20% that will be available to the public.

China's incorporation of technology modernization has led to the NGCP's latest

Transmission Development Plan to include the consideration of Competitive Renewable Energy Zones (CREZ). These allow for early transmission planning, the inclusion of battery energy storage systems and the adoption of smart grid technologies including a smart grid pilot project. The modernization upgrades the Energy Management System (EMS) to provide variable renewable energy simulation and forecasting. The co-financing of this modernization is anticipated to come from an initial public offering (IPO) of USD 1.5 billion with support from domestic Philippine banks. NGCP is targeting an IPO of as high as USD 2 billion and a valuation of USD 8 to 10 billion.

According to the latest Transmission Development Plan consultation draft, NGCP's prioritization of its projects are based on the following project drivers: generation entry, load growth, system reliability and security, power quality and technology, policy direction, and market operation support.

Based on historical data from previous consumption in Luzon, Visayas and Mindanao from 2005 to 2019, the country has an average annual compounded growth rate (AACGR) of 6.23% for the period 2021-2025, 6.73% for 2026-2030 and 6.49% for 2031-2040. Mindanao is expected to have the highest growth rate among the three regions once finally connected to the main grid.

Source: NGCP

With a projected increase in consumption, generation is expected to follow. After the DOE signed the coal moratorium last year, more renewable energy sources are expected to come in the market. The transmission development plan anticipates more RE in the system with the grid resilience policy taking into consideration potential impacts of disasters, climate change adaptation measures, and asset replacement, transmission operator is also preparing to integrate energy storage systems in the grid that will include a battery energy storage system (BESS), compressed air energy storage (CAES), flywheel energy storage (FES), and pumped-storage hydropower (PSH).

ANCILLARY SERVICES IN CHINA AND THE PHILIPPINES

Originally, because of the Chinese power market's limitations and weak grid structure, power dispatch was centralized to ensure safe operation, and transactions in the ancillary service market were not considered. Ancillary was previously directly invoked by the dispatch centers, making most ancillary services free of charge – an inefficient business model for power generation companies to provide additional ancillary services.

Due to a now more-developed grid that allows better energy management, and the growing demand for more sustainable power sources, China's National Energy Administration said, "the ancillary services market will be transitioning from a basic compensation mechanism to a market integrated with spot energy prices" as part of its long-term Clean Energy Consumption draft. Energy storage is seen as one of the main drivers of the Chinese ancillary services, with both front-of-the-meter (FTM) and behind-the-meter storage used for commercial and industrial.

On the other hand, the National Grid Corporation of the Philippines has also highlighted the importance of ancillary services in the Philippine grid. Ancillary service providers go through accreditation, but because of their limited numbers and inadequate generator capacity and the poor response times of these providers, the Grid's reserve requirements and ability sustain reliability objectives are falling short not being met.

It is important to note that while China's ancillary plans are shifting heavily towards energy efficiency by absorbing more renewable energy, utilizing available battery storage technologies, and supporting the transportation sector, NGCP ancillary services are still focused on grid stability.

And according to the Philippine Department of Energy, NGCP has been consistently non-compliant with the required reserve levels it must procure for firm ancillary services. DOE said that NGCP has been contracting only contracting 48% regulating, 27% contingency and 22% dispatchable reserves of the required amounts. Other than the insufficient reserves, NGCP also enters non-firm contracts that violate the 2019 department circular which sets the ancillary service rules. Non-firm contracts mean that adequate reserves cause insufficient or low power supply – especially during the summer months – according to DOE Secretary Alfonso Cusi.

Grid modernization to allow for the power system to take advantage of rapid technological improvements is a key opportunity to improve cost-competitive and socio-economic outcomes. Additionally, it would enhance ancillary service market for ramping products, fast frequency response from batteries, and attract new market participants to provide ancillary services.
These could be from wind turbines providing inertial response, solar PV and utility-scale storage providing voltage support, and distributed energy resources providing frequency and voltage control.

REFLECTIONS

A STRONGER AND SMARTER GRID FOR THE PHILIPPINES IN PARTNERSHIP WITH CHINA

BY: SARA JANE AHMED

Chinese companies make up over one-third of the world's wind manufacturing, over 70 percent of the world's solar PV manufacturing and almost 75 percent of the world's lithium-ion battery production. Considering that there are more cost-competitive and diverse system options for flexibility and balancing variable renewables than locking in fossil gas, this decade represents an historic opportunity for China to become a South-South partner of choice for climate vulnerable developing countries.

Investment in transmission modernization is critical to realize an economic transformation that delivers climate and economic resilience and jobs for both China and developing countries. China's readiness to seize opportunities over the next two to three years is vital as the European Union and the United States adopt industry strategies to create competitive manufacturing and deploy modernized technologies in renewable energy and batteries.

The opportunity for China's SGCC extends beyond transmission and generation capacity. The smarter grids that it is able to build, as planned for the Philippines, include better demand response and user-to-user trading, create a scenario in which SGCC enables a truly competitive landscape where distribution utilities are no longer natural monopolies and grid modernization enables a transmission system that includes retail markets for renewable energy and storage providers, manufacturers, operators, and investors.

ANNEXES

ANNEX A

NGCP Key Financials from 2009 to 2015, Php Billions (USD in gray[2])

Year	Maximum Allowable Revenue (set by ERC)	Revenue	EBITDA	Operating Income	Net Income
2009	39.51 ($823.94 M)	39.53 ($824.40 M)	33.32 ($694.89 M)	26.42 ($550.99 M)	15.42 ($321.58 M)
2010	44.99 ($938.22 M)	45.21 ($942.86 M)	36.45 ($760.17 M)	28.76 ($599.79 M)	18.57 ($387.28 M)
2011	44.89 ($936.15 M)	45.61 ($951.20 M)	38.01 ($792.70 M)	30.89 ($644.21 M)	21.60 ($450.47 M)
2012	42.90 ($894.84 M)	44.60 ($930.13 M)	37.32 ($778.31 M)	30.18 ($629.40 M)	20.84 ($434.64 M)
2013	44.57 ($929.67 M)	44.52 ($928.47 M)	36.24 ($755.79 M)	28.77 ($600.00 M)	21.19 ($441.92 M)
2014	42.51 ($886.51 M)	45.19 ($942.44 M)	36.60 ($763.29 M)	29.08 ($606.46 M)	22.06 ($460.06 M)
2015	43.08 ($898.43 M)	45.70 ($953.07 M)	37.36 ($779.14 M)	29.57 ($616.68 M)	22.51 ($469.45 M)

Source: Securities and Exchange Commission

NGCP Cash Flows and Dividends, Php Billions (USD in gray[3])

Year	EBITDA	Capex and Concession Fee*	Estimated Free Cash Flow	Dividends	Cumulative Dividends
2009	33.32 ($694.89 M)	2.81 ($58.60 M)	30.51 ($636.29 M)	6.84 ($142.65 M)	6.84 ($142.65 M)

[2] 1 USD = 47.9501 PHP as of May 21, 2021

[3] 1 USD = 47.9501 PHP as of May 21, 2021

2010	36.45 ($760.17 M)	6.66 ($138.89 M)	29.79 ($621.27 M)	15.00 ($312.83 M)	21.84 ($455.47 M)
2011	38.01 ($792.70 M)	13.58 ($283.21 M)	24.43 ($509.49 M)	22.00 ($458.81 M)	43.84 ($914.28 M)
2012	37.32 ($778.31 M)	9.33 ($194.58 M)	27.99 ($583.73 M)	18.00 ($375.39 M)	61.84 ($1,289.67 M)
2013	36.24 ($755.79 M)	12.36 ($257.77 M)	23.88 ($498.02 M)	24.00 ($500.52 M)	85.84 ($1,790.19 M)
2014	36.60 ($763.29 M)	12.55 ($261.73 M)	24.05 ($501.56 M)	24.00 ($500.52 M)	109.84 ($2,290.71 M)
2015	37.36 ($779.14 M)	16.40 ($342.02 M)	20.96 ($437.12 M)	21.00 ($437.96 M)	130.84 ($2,728.67 M)

Source: Securities and Exchange Commission, computation from Office of Senator Sherwin Gatchalian, *excludes the initial 25% concession fee and the prepaid concession fees
NGCP took over the transmission operation with P46 billion or $1 billion investment, which was used to pay for the 25% upfront concession fee in 2009.

ANNEX B

Timeline of NGCP's IPO delay

Date	Event	Contents
November 13, 2018	NGCP files instant petition before the Electricity Regulatory Commission approval of its proposed extension of the period for listing of its shares.	1. The pending Arbitration case filed before the Singapore International Arbitration Centre (SIAC) docketed as SIAC Case No. ARB044/18/CHB against PSALM and TransCo, pursuant to their Concession Agreement. 2. The delayed Regulatory Reset. 3. The period provided for compliance with Section 8 of RA 9511 is merely directory. 4. There is no Implementing Rules and Regulations (IRR) for compliance with Section 8 of RA 9511; and 5. The timing of public offering is addressed to the discretion of NGCP's Board of Directors
December 21, 2018	Opposition/comment filed by TransCo	1. Questioned the authority and jurisdiction of ERC over the instant petition, and

		2. Argued that NGCP had ten years to comply with its public listing obligation, but instead filed for extension two months before the lapse of the time for compliance.
February 15, 2019	Petition for Intervention Ad Cautelam filed by TransCo and PSALM	1. Argued that the instant Petition filed by NGCP be dismissed because ERC does not have jurisdiction to hear and decide the case; and 2. Argued that TransCo is the owner of the transmission assets being operated by NGCP, while PSALM owns TransCo.
April 3, 2019	Senate Energy Committee Hearing	NGCP Spokesperson Cynthia Alabanza listed the following reasons for delayed IPO: 1. Absence of the final determination of price control arrangements from the ERC for the fourth regulatory period (2016-2020). 2. The pending disputes among NGCP, TransCo and PSALM, which are now in arbitration. 3. The public threats made against NGCP's concession, whether these are raised in arbitration.
June 25, 2019	ERC resolved the Petition for Intervention Ad Cautelam filed by TransCo and PSALM	1. The Petition for Intervention filed by TransCo and PSALM was denied for lack of merit; and 2. ERC claimed jurisdiction to hear and decide the instant petition originally filed by NGCP.
August 9, 2019	TransCo and PSALM filed a Joint Petition for Reconsideration	1. Maintained their position that possess direct and substantial interest in the instant proceedings; and 2. Reiterated that ERC does not have jurisdiction over the instant petition since the ten-year period mentioned under RA 9511 requiring NGCP to make a public offering of its shares has already lapsed.
August 14, 2019	ERC issued an order directing NGCP to file its comment on TransCo and PSALM's Motion for Reconsideration	
September 9, 2019	NGCP filed an Opposition to the Motion for Reconsideration filed by TransCo and PSALM	

September 30, 2019	House Committee on Energy Hearing	PBA Partylist Representative Jericho Nograles threatened to withdraw NGCP's franchise if the company continues to delay their IPO.
October 1, 2019	TransCo and PSALM filed a Manifestation with Urgent Motion to Resolve Joint Motion for Reconsideration dated September 28, 2019	
October 8, 2019	ERC resolved by NGCP's Opposition, and TransCo and PSALM's Motion for Reconsideration	1. Motion for Reconsideration was denied. According to ERC, a mere invocation of the EPIRA, which created TransCo and PSALM, does not automatically vest them the right to intervene in the instant proceedings. Moreover, nothing in the Concession Agreement can be found provision that authorizes either TransCo or PSALM to ensure that NGCP complies with its franchise law, particularly its public listing obligation. It is beyond the ambit of TransCo and PSALM's authority to ensure NGCP's compliance with the provisions of its franchise law. 2. ERC has jurisdiction over the instant petition filed by NGCP.
April 27, 2020	ERC issued a Decision dated March 3, 2020, denying NGCP's instant petition	Denied and directed to comply with the following: 1. NGCP is directed to commence immediately the process of publicly listing pursuant to RA 9511 and to fully comply with the same within six months from receipt of this Decision; and 2. NGCP is directed to submit a Compliance Report showing its compliance with its public listing obligation within thirty days from said compliance.
May 27, 2021	TransCo filed a Manifestation Ad Cautelam dated May 26, 2020	
June 15, 2020	NGCP filed a Counter-Manifestation Ad Cautelam in response to TransCo	
August 28, 2020	NGCP filed a Motion for Reconsideration in response to ERC	NGCP asked ERC to: 1. Approve the Petition for the Extension of the Period for

	Decision dated May 3, 2020	Listing of the Shares of Stock of NGCP; and 2. Grant an extension of one year from the resolution with finality of the arbitration case docketed as SIAC Case No. ARB044/18/ CHB and any related appeals, whichever is later, within which NGCP should comply with Section 8 of RA 9511, unless another reasonable extension is duly granted by ERC upon application of NGCP, and after notice and hearing, should market conditions then not be suitable; or 3. Alternatively suspend the period within which NGCP should comply with Section 8 of RA 9511, pending the issuance by ERC of the implementing rules and guidelines of Section 8 of RA 9511.
September 18, 2020	TransCo filed a Comment Ad Cautelam to NGCP's Motion of Reconsideration to the March 3, 2021, Decision	
September 28, 2020	NGCP filed a Reply in response to TransCo's Comment Ad Cautelam	
October 30, 2020	PSALM filed a Comment with Manifestation	
October 30, 2020,	Senator Sherwin Gatchalian urged ERC to issue an ultimatum to NGCP to comply with IPO requirement	
November 20, 2020	ERC issued an Order dated November 10, 2020, setting the Motion for Reconsideration for virtual hearing on November 27, 2020	
November 27, 2020	NGCP made oral arguments on the allegations contained in its Motion for Reconsideration	
January 7, 2021	NGCP announced plans for IPO	Initial public offering that could raise as much as $1 billion
February 3, 2021	NGCP filed an Urgent Motion to Set the Attached Urgent Manifestation and	The modified last prayer read as follows: Should ERC not find sufficient basis

	Motion for Hearing	to consider its Decision dated March 3, 2020, NGCP prays that it be granted at least 18 months from date of service of the Resolution resolving its Motion for Reconsideration, without prejudice to such further extensions as may be warranted by the economic and market conditions then prevailing, within which to comply with the dispersal of ownership requirement under Section 8 of RA 9511.
March 10, 2021	ERC denied NGCP's Motion for Reconsideration and the Urgent Manifestation and Motion	1. The Motion for Reconsideration and Urgent Motion and Manifestation are denied for lack of merit since NGCP failed to establish the unsuitability of the market condition at the time of filing the petition which was before the pandemic. ERC called NGCP's claim that the market conditions were unsuitable for an IPO as a mere excuse since PSEi posted its highest ever historical score at 9,078 just ten months prior to the date of the filing of the petition. Furthermore, companies like MerryMart Consumer Corp and Converge ICT Solutions made their initial public listing despite the pandemic. 2. NGCP is given a period of six months to **finish** its public listing process. ERC required NGCP to complete within the period of six months from the date of receipt of this Order its IPO requirement and ultimately make a public offering of its shares in compliance with Section 8 of RA 9511.
March 17, 2021	NGCP taps banks for $1.5 billion IPO, could go as high as $2 billion	NGCP selected Bank of America Corp., JP Morgan Chase & Co., and UBS Group AG to work on a time-share sale. NGCP is seeking a valuation of $8 billion to $10 billion which could happen in 4Q 2021.
May 20, 2021	ERC verified NGCP's application for approval of its Registration Statement with Securities and Exchange Commission (SEC) and Listing with the Philippine Stock Exchange (PSE) will be filed in June 2021.	

Source: Energy Regulatory Commission, Senate of the Philippines, various news outlets

ANNEX C

Top Ten Most Bankable Solar Energy Companies in the World (2020)

Canadian Solar	Canada
JA Solar	China
Jinko Solar	China
Longi	China
Trina Solar	China
LG Electronics	South Korea
SunPower	United States
BYD	China
Hanwha QCells	South Korea
Chint / Astronergy	Australia

Source: BNEF 2020

Top Ten Most Bankable Inverter Companies in the World (2020)

Sungrow	China
Huawei	China
Fronius	Austria
SMA	Germany
SolarEdge	Israel
Schneider Electric	France
Chint	China
Power Electronics	Spain
TMEIC	Japan
KACO	Germany

Source: BNF 2020

Top Ten Largest Wind Energy Companies in the World (2020)

Siemens	Spain / Germany
Vestas	Denmark
GE Renewable Energy	France
Enercon	Germany
Nordex SE	Germany
Senvion SE	Germany
Goldwind	China
Sinovel Wind	China
Suzlon	India
MHI Vestas Offshore Wind	Denmark / Japan

Source: Yahoo Finance

Top Ten Electric Vehicle Manufacturers in the World (2020)

Renault-Nissan	France / Japan
Tesla	United States
BAIC Group	China
Zotye	China
Zhidou Electrical	China
BMW	Germany
Chevrolet	United States
Hyundai	South Korea
Geely	China
JAC Motors	China

Source: Energy Digital

REFERENCES

- Asian Development Bank (2018). Philippines Energy Sector Assessment, Strategy and, Road Map. Available at: https://www.adb.org/sites/default/files/publication/463306/philippines-energy-assessment-strategy-road-map.pdf
- Bloomberg (2021). Philippines' National Grid Plans $1 Billion IPO. Available at: https://www.bloomberg.com/news/articles/2021-01-06/philippines-national-grid-is-said-to-plan-1-billion-ipo
- Bloomberg New Energy Finance (2020). New Energy Outlook 2020. Available upon subscription.
- Business World (2021). ERC gives NGCP six months to complete $1-billion IPO. Available at: https://www.bworldonline.com/erc-gives-ngcp-six-months-to-complete-1-billion-ipo/
- Business World (2021). NGCP taps banks for $1.5-billion IPO. Available at: https://www.bworldonline.com/ngcp-taps-banks-for-1-5-billion-ipo/
- Business World (2021). NGCP found non-compliant on AS reserve levels. Available at: https://www.bworldonline.com/ngcp-found-non-compliant-on-as-reserve-levels/
- Business World (2021). NGCP to comply with ERC directive for maiden offer. Available at: https://businessmirror.com.ph/2021/05/20/ngcp-to-comply-with-erc-directive-for-maiden-offer/
- Center for American Progress (2011). China Pours Money into Smart Grid Technology. Available at: https://www.americanprogress.org/issues/green/reports/2011/10/24/10473/china-pours-money-into-smart-grid-technology/
- Department of Energy (2021). DOE Pushes NGCP to Contract Sufficient Power Reserves for Energy Reliability. Available at: https://www.doe.gov.ph/press-releases/doe-pushes-ngcp-contract-sufficient-power-reserves-energy-reliability?ckattempt=1
- Energies (2012). The Smart Grids in China – A Review. Available at: https://www.mdpi.com/1996-1073/5/5/1321/htm
- Energy Bar Association (2016). Smart Grids in China: Industry Regulation and Foreign Direct Investment. Available at: https://www.eba-net.org/assets/1/6/22-135-176-Feng_FINAL.pdf
- Energy Digital (2020). Top 10 electric vehicle manufacturers in the world. Available at: https://energydigital.com/top10/top-10-electric-vehicle-manufacturers-world

- Energy Regulatory Commission (2018). ERC Case No. 2018-014 MC.
  Available at: https://www.erc.gov.ph/Files/Render/issuance/29994
- Energy Regulatory Commission (2021). ERC Case No. 2018-014 MC.
  Available at: https://www.erc.gov.ph/Files/Render/issuance/40966
- IIEE Spectrum (2019). China's Ambitious Plan to Build the World's Biggest Supergrid.
  Available at: https://spectrum.ieee.org/energy/the-smarter-grid/chinas-ambitious-plan-to-build-the-worlds-biggest-supergrid
- Manila Bulletin (2019). House panel threatens to withdraw NGCP franchise for failure to implement IPO.
  Available at: https://mb.com.ph/2019/09/30/house-panel-threatens-to-withdraw-ngcp-franchise-for-failure-to-implement-ipo/
- Manila Bulletin (2020). ERC orders NGCP to undertake stock offering soonest.
  Available at: https://mb.com.ph/2020/05/06/erc-orders-ngcp-to-undertake-stock-offering-soonest/
- Manila Bulletin (2021). NCGP plans $1-billion IPO.
  Available at: https://mb.com.ph/2021/01/07/ngcp-plans-1-billion-ipo/
- Manila Standard (2018). NGCP files arbitration case vs PSALM, TransCo.
  Available at: https://manilastandard.net/business/power-technology/263991/ngcp-files-arbitration-case-vs-psalm-transco.html
- Manila Times (2017). TransCo claims NGCP violated concession agreement.
  Available at: https://www.manilatimes.net/2017/05/05/business/transco-claims-ngcp-violated-concession-agreement/325609/
- National Grid Corporation of the Philippines (n.d.). NCGP History.
  Available at: https://www.ngcp.ph/profile#history
- National Grid Corporation of the Philippines (2021). Transmission Development Plan 2021-2040 (Consultation Draft).
  Available at: https://ngcp.ph/Attachment-Uploads/Transmission%20Development%20Plan%202021%20-%202040%20Consultation%20Draft%20Report-2021-01-15-11-27-08.pdf
- National Transmission Corporation (2009). 2009 Accomplishment Report.
  Available at: https://www.transco.ph/downloads/2009accomp.pdf
- National Transmission Corporation (2019). 2019 Annual Report.
  Available at: https://www.transco.ph/downloads/cgs/2019_AnnualReport.pdf
- Office of Senator Sherwin Gatchalian. Research Brief on Energy Financial Assessment of NGCP.
  Available at: http://wingatchalian.com/wp-content/uploads/2018/10/RESEARCH-BRIEF-NGCP-Financials-6.7.17-VGD.pdf
- Office of Senator Sherwin Gatchalian (2020). To ERC: Issue an ultimatum on NGCP on IPO requirement.
  Available at: http://wingatchalian.com/news/to-erc-issue-an-ultimatum-on-ngcp-on-ipo-requirement/
- Power Sector Assets and Liabilities Management Corporation (2008). Concession Agreement.
  Available at: https://www.transco.ph/downloads/CONCESSIONAGREEMENTOCR.pdf

- PV Magazine (2021). China reaches a tipping point in 2021.
  Available at: https://www.pv-magazine.com/2021/05/13/china-reaches-a-tipping-point-in-2021/

- Renewable and Sustainable Energy Reviews (2014). The ancillary services in China: An overview and key issues.
  Available at: https://www.sciencedirect.com/science/article/pii/S1364032114002676

- Renewable and Sustainable Energy Reviews (2014). Smart Grids in China.
  Available at: https://www.sciencedirect.com/science/article/pii/S1364032114003761

- Republic of the Philippines (2008). Republic Act No. 9511
  Available at: https://www.officialgazette.gov.ph/2008/12/01/republic-act-no-9511/?TSPD_101_R0=e6beb6bc593287c657838ad93502a9f2l5l0000000000000001f1c9e88ffff00000000000000000000000060acbc8c007002638e0853bbb257ab2000cab538f13b03e4468c345526fdefabda56da342f564b7bdcce9152ea0629810c089a5f7a130a2800abb373be046326a14d98596d871d253ec00cb2a7eb4522e5d12acdb030f9b30d0aa9aa3b6dee50a4

- SmartGrid.gov (n.d.). Recovery Act: Featured Case Studies.
  Available at: https://www.smartgrid.gov/recovery_act/featured_case_studies.html

- Springer Open (2014). Regulatory Pathways For Smartgrid Development in China.
  Available at: https://link.springer.com/content/pdf/10.1007%2F978-3-658-08463-9.pdf

- Supreme Court of the Philippines (2020). G.R. No. 232199 National Transmission Corporation versus Commission on Audit and COA Commissioner Michael G. Aguinaldo.
  Available at: https://sc.judiciary.gov.ph/17196/

- State Grid Corporation of China (n.d.). SGCC Overseas Projects.
  Available at: http://www.sgcc.com.cn/html/sgcc_main_en/col2017112817/column_2017112817_1.shtml

- T&D World (2019). Emerging Trends in Grid Modernization Effort.
  Available at: https://www.tdworld.com/grid-innovations/smart-grid/article/20972757/emerging-trends-in-grid-modernization-efforts

- Yahoo Finance (2020). 10 Largest Wind Energy Companies in the World.
  Available at: https://finance.yahoo.com/news/10-largest-wind-energy-companies-105655228.html