



Republic of the Philippines
Department of Energy



ASIA **EDGE**
Advancing the Energy and Economic Development of the U.S. and the Asia-Pacific Region

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University of the Philippines Statistical
Center Research Foundation, Inc.

PHILIPPINE DOWNSTREAM NATURAL GAS INDUSTRY

INVESTORS' GUIDE



Supported under the



**GAS POLICY
DEVELOPMENT PROJECT**



Republic of the Philippines
Department of Energy



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Research for Development and Growth through Energy
The Asia Center for Statistical Energy Research



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LIST OF ACRONYMS

AHTN	Association of Southeast Asian Nations Harmonized Tariff Nomenclature
ALARP	As Low as Reasonably Practicable
AO	Administrative Order
ASEAN	Association of Southeast Asian Nations
AST	Acknowledgement to Supply and Transport
ATI	Acknowledgement to Import
ATIGA	Association of Southeast Asian Nations Trade in Goods Agreement
BFP	Bureau of Fire Protection
BIR	Bureau of Internal Revenue
BOC	Bureau of Customs
BOG	Boil-Off Gas
BOI	Bureau of Investments
BOQ	Bureau of Quarantine
BOR	Boil-Off Rate
BWC	Bureau of Working Conditions
CEO	City Engineer's Office
CHO	City Health Office
CLDP	Commercial Law Development Program
CP	Certificate of Pre-Condition
CREC	Centralized Review and Evaluation Committee
DAS	Distribution Asset Study
DC	Department Circular
DENR	Department of Environment and Natural Resources
DILG	Department of Interior and Local Government
DIS	Distribution Impact Study
DNG-REC	Downstream Natural Gas - Review and Evaluation Committee
DO	Department Order
DOE	Department of Energy
DOH	Department of Health
DOLE	Department of Labor and Employment
DOTr	Department of Transportation
ECC	Environmental Compliance Certificate
EICC	Energy Investment Coordinating Council

LIST OF ACRONYMS

EIS	Executive Information System
EISS	Environmental Impact Statement System
EMB	Environmental Management Bureau
ENR	Bureau of Energy Resources
EO	Executive Order
EPC	Engineering, Procurement, and Construction
EPIRA	Electric Power Industry Reform Act
EPNS	Energy Project of National Significance
EVOS	Energy Virtual One-Stop Shop
FEED	Front End Engineering Design
FLNG	Floating Liquefied Natural Gas
FPIC	Free and Prior Informed Consent
FS	Financial Statement
FSIC	Fire Safety Inspection Certificate
FSRU	Floating Storage and Regasification Unit
GHG	Greenhouse Gas
GIS	General Information Sheet
GPDP	Gas Policy Development Project
GSPA	Gas Sale and Purchase Agreement
HASP	Health and Safety Plan
HAZID	Hazard Identification
HAZOP	Hazard and Operability
HDMF	Home Development Mutual Fund
HSSE	Health, Safety, Security, and Environment
IGU	International Gas Union
IPP	Investment Priorities Plan
IRR	Implementing Rules and Regulations
LGU	Local Government Unit
LNG	Liquefied Natural Gas
MARINA	Maritime Industry Authority
MARSEC	Maritime Security Command
MEPCOM	Marine Environmental Protection Command
MFN	Most Favored Nation

MOA	Memorandum of Agreement
MSSC	Marine Safety Services Command
NCIP	National Commission on Indigenous Peoples
NEC	National Engineering Center
NGMD	Natural Gas Management Division
NGVPPT	Natural Gas Vehicle Program for Public Transport
NIRC	National Internal Revenue Code
NPC	National Power Corporation
NTP	Notice to Proceed
OEM	Original Equipment Manufactured
OIC	Omnibus Investments Code
OIMB	Oil Industry Management Bureau
ORF	Onshore Receiving Facility
OSHC	Occupational Safety and Health Center
OTS	Off-Take Station
OxyPhil	Occidental Philippines, Inc.
PCERM	Permit to Construct, Expand, Rehabilitate, and Modify
PCG	Philippine Coast Guard
PD	Presidential Decree
PDNGI	Philippine Downstream Natural Gas Industry
PDNGR	Philippine Downstream Natural Gas Regulation
PDP	Power Development Plan
PEP	Philippine Energy Plan
PhilHealth	Philippine Health Insurance Corporation
PIA HSSE IMT	Philippine Interagency Health, Safety, Security, and Environment Inspection and Monitoring Team
PNOC	Philippine National Oil Company
PNOC-EC	Philippine National Oil Company - Exploration Corporation
POM	Permit to Operate and Maintain
PPA	Philippine Ports Authority
PSC	Port State Control
PSPC	Pilipinas Shell Petroleum Corporation
RA	Republic Act

LIST OF ACRONYMS

RE	Renewable Energy
SC	Service Contract
SEC	Securities and Exchange Commission
SPEX	Shell Philippines Exploration B.V.
SSLNG	Small-Scale Liquefied Natural Gas
SSS	Social Security System
TC	Technical Committee
TCCP	Tariff and Customs Code of the Philippines
TPA	Third-Party Access
TRAIN	Tax Reform for Acceleration and Inclusion
UP	University of the Philippines
UPSCRFI	UP Statistical Center Research Foundation, Inc.
USDS	United States Department of State
VS	Virata School of Business
WEO	World Energy Outlook

UNITS OF MEASUREMENT

bcf	billion cubic feet
bcm	billion cubic meter
GW	gigawatt
GWh	gigawatt-hour
km	kilometer
ktoe	kilotonnes/thousand tonnes of oil equivalent
kV	kilovolt
m³	cubic meter
mmscfd	million standard cubic feet per day
mtoe	million tons of oil equivalent
mtpa	metric ton per annum
MW	megawatt
tcf	trillion cubic feet

MESSAGES



In order to safeguard our energy future, the Department of Energy (DOE) remains tireless in finding ways to ensure the stable and secure supply of energy in the country.

To this end, we have been actively taking all the necessary steps to attain energy security and sustainability in the midst of a continuing upsurge in energy demand, and in anticipation of the eventual depletion of the Malampaya gas field. This includes developing the full potential of our national downstream natural gas industry. In fact, our 2017-2040 downstream natural gas roadmap calls for the expansion of our supply source, infrastructure and market enhancement, capacity and skills building for agency regulators, as well as the formulation and efficient implementation of relevant sectoral policies.

Centering on market and infrastructure development, the DOE, through the assistance of the Gas Policy Development Project, prepared this Investors' Guide to serve as a reference for industry stakeholders on the application requirements and processes involved in putting up a liquefied natural gas (LNG) facility. The Guide also provides an overview of the LNG industry in the country; the current regulatory framework, incentives and policies; as well as a discussion on potential investment areas.

It is our sincere hope that this undertaking would help usher in more energy investments needed to empower the future of generations to come.

Secretary Alfonso G. Cusi
Department of Energy



I am honored to mark a significant achievement for the U.S. and Philippine partnership under our Asia EDGE (Enhancing Development and Growth through Energy) Initiative: the publication of the Gas Policy Development Project's (GPDP) LNG Investors' Guide.

We are living in a period of unprecedented energy transformations, both in terms of energy supply and demand patterns. The Indo-Pacific region represents two-thirds of global energy demand growth through 2040. It needs affordable, reliable energy to support a vibrant, young population and economic growth like that occurring in the Philippines.

The Philippine government's decision to develop its LNG sector to complement energy sources is a significant and pioneering accomplishment. In doing so, the Philippines is creating a level playing field for all competitors and helping to attract qualified investors that deliver high standards and quality infrastructure.

The United States is pleased to play our part through our world-leading companies and technical cooperation. Under Asia EDGE, the U.S. Department of State funds the GPDP, which supports the Philippine government in developing gas and LNG sector legal and regulatory frameworks and best practices. GPDP's LNG Investors' Guide helps ensure a rules-based process for accessing the Philippines' LNG market by clarifying for investors the requirements for LNG Project Application, major permits to be secured, and contact details of relevant government offices.

I consider the LNG Investors' Guide to be one of the capstones of Phase One of GPDP and am pleased to have supported this cooperation.

Francis R. Fannon

Assistant Secretary, Bureau of Energy Resources
U.S. Department of State

MESSAGES



Energy is crucial in sustaining economic growth as it powers enterprises and fuels industries that ultimately drive the economy. As the Philippines continues to grow and develop, its energy demand is expected to substantially increase, projected to reach 56,136 MW by 2040, almost four times the demand in 2018 .

With this growing demand is a challenge magnified by the anticipated depletion of the Malampaya gas field. The Department of Energy (DOE) recognizes this urgent need to find additional energy sources to ensure energy security for the coming years. Part of the DOE's Nine-Point Agenda is to develop liquefied natural gas (LNG) needs for the future in anticipation of the Malampaya depletion.

This Investors' Guide provides information for potential energy players that will contribute to our objective of achieving energy security. It outlines pertinent information to our private sector partners in setting up an LNG facility here in the Philippines. Through this guidebook, we hope to foster a transparent and systematic application and permitting process that coincide with the Ease of Doing Business. We envision that this would facilitate an environment conducive to attracting more investments in the downstream LNG industry.

We would like to thank the United States Department of State (USDS) and the UP Statistical Center Research Foundation, Inc. (UPSCRFI) through the Gas Policy Development Project (GPDP) for putting together this guidebook with the support of the Philippine Interagency Health, Safety, Security, and Environment Inspection and Monitoring Team (PIA HSSE IMT).

Together with our partner agencies, we hope this guidebook will serve as a practical reference to all potential investors and pave the way to a vibrant LNG sector.

Undersecretary Donato D. Marcos
Department of Energy



Congratulations to the Department of Energy and the Gas Policy Development Project for the successful formulation of the LNG Investors' Guide.

It is indeed high time that we take initiatives that would make the Liquefied Natural Gas (LNG) market attractive to investors and other key players to fast-track its progress.

As chairman of the Senate Committee on Energy, one legislative measure the Committee is pushing that supports the commencement and growth of LNG as a source of energy is the natural gas industry development bill, which is currently in the process of completion.

Through the Natural Gas Industry Development Bill, it is our hope that energy stakeholders recognize LNG as a worthwhile investment and a good complement to other energy sources as it is cleaner relative to other fossil fuels and also addresses the intermittency of variable energy sources. Hence, we are doubling our efforts to ensure this crucial piece of legislation will be passed this Congress.

To our investors and stakeholders, I trust your continuous support to the initiatives of the government to achieve growth in the energy sector. I hope this Guide will help you navigate the LNG market efficiently.

Rest assured that I will be your constant ally in fostering energy sustainability, affordability, and reliability in the country.

Mabuhay tayong lahat!

Senator Sherwin T. Gatchalian

Chairperson, Senate Committee on Energy

MESSAGES



The country cannot afford to lose the supply of liquefied natural gas (LNG) as it will hamper commercial and industrial activities that are imperative to economic growth. Hence, the development of the Philippine LNG industry is among the House Committee on Energy's priorities to ensure that the energy sector is broadly prepared when the Malampaya gas field depletes by 2024. With less than five years to gear up, the Committee has been working tirelessly with various energy players to gather ideas on crafting coherent and evidence-based policies that will stimulate and sustain the growth of the LNG industry in the country.

The Committee commends the Department of Energy's (DOE) effort to lay down the groundwork in building up the industry. The issuance of the Philippine Downstream Natural Gas Regulation (PDNGR) in November 2018 was a bold step to trigger advances in LNG businesses in the country. In addition, the DOE's collaboration with the Gas Policy Development Project (GPDP) brought forth the completion of this LNG Investors' Guide. We believe this Guide will be instrumental in providing the necessary information to all the key players involved in developing the LNG industry. This Guide is fully in line with the Committee's advocacy to streamline the business processes in the government as envisioned in the enactment of the Energy Virtual One-Stop Shop (EVOSS) Act (R.A. No. 11234) on May 28, 2019, eliminating unnecessary activities that discourage potential investments and impede economic progress.

We are hopeful that this Guide will rightfully serve its purpose. The Committee guarantees its full support to these kinds of initiatives and, at the same time, commits to create or amend energy policies that are attuned to boosting the development of the Philippine LNG Industry.

Representative Lord Allan Jay Q. Velasco

Chairperson, House of Representatives Committee on Energy

ACKNOWLEDGMENT

This Guide was prepared by the Gas Policy Development Project (GPDP) and Department of Energy (DOE) core team through a series of discussions and data gathering from the members of the Philippine Interagency Health, Safety, Security, and Environment Inspection and Monitoring Team (PIA HSSE IMT). The team is grateful for the valuable input of the following government agencies:

- DOE: Oil Industry Management Bureau - Natural Gas Management Division (OIMB - NGMD)
- Department of Labor and Employment (DOLE): Occupational Safety and Health Center (OSHC) and Bureau of Working Conditions (BWC)
- Department of Health (DOH): Bureau of Quarantine (BOQ)
- Department of Interior and Local Government (DILG): Bureau of Fire Protection (BFP)
- Department of Environment and Natural Resources (DENR): Environmental Management Bureau (EMB)
- Department of Transportation (DOTr):
 - Philippine Coast Guard (PCG) - Marine Environmental Protection Command (MEPCOM), Maritime Safety Services Command (MSSC), Port State Control (PSC), Maritime Security Command (MARSECOM)
 - Maritime Industry Authority (MARINA)
 - Philippine Ports Authority (PPA)
- Batangas City Local Government Unit (LGU):
 - City Engineer's Office (CEO)
 - City Health Office (CHO)

The team is also grateful for the input and support of the University of the Philippines Diliman (UP) - National Engineering Center (NEC) led by Dr. Rizalinda de Leon and Mr. Mark Asinas of the Virata School of Business (VSB).

This initiative was made possible with the financial and technical support of the Bureau of Energy Resources (ENR), United States Department of State (USDS) and the Commercial Law Development Program (CLDP) under the Asia EDGE (Enhancing Development and Growth through Energy) initiative.

OVERVIEW

The Department of Energy (DOE), in partnership with the UP Statistical Center Research Foundation, Inc. (UPSCRFI), formally launched the Gas Policy Development Project (GPDP) on December 7, 2018. The GPDP provides technical assistance to the DOE in implementing Department Circular (DC) No. 2017-11-0012 or the Philippine Downstream Natural Gas Regulation (PDNGR).

This LNG Investors' Guide was developed by the Project with the DOE-Oil Industry Management Bureau (OIMB) to provide information on potential LNG investments in the country as well as the procedures and requirements in the pre-construction and operation of the facilities including permit and clearance requirements from other government agencies. This Guidebook is divided into the following sections:

- 1: Natural Gas Industry: Outlook and Potential Investments
- 2: The Philippine Downstream Natural Gas Industry Regulatory Framework
- 3: Incentives and Policies that Facilitate Investments
- 4: Primer for Application



1 | NATURAL GAS INDUSTRY: OUTLOOK AND POTENTIAL INVESTMENTS

The Philippines has had a natural gas industry since 2002. The industry has produced indigenous gas used in generating part of the electricity requirement of users in Luzon. The gas comes from Malampaya's offshore well in Palawan that is then brought to Batangas City. Nearly all of the gas produced in Malampaya has gone into about 29% of Luzon's electricity requirements based on the current capacity of the power industry in Luzon.

In less than five years, however, the gas supply from Malampaya will start to decline. The Philippines does not have any other indigenous gas supply to seamlessly replace Malampaya's by then.

The impending end of Malampaya's gas supply sans an indigenous gas replacement has compelled the Philippines to work now to avoid an energy crisis like what it had in the early 1990s. Preparations are underway to bring liquefied natural gas (LNG) into the country and create a new industry based on LNG. The preparations take about the same number of years Malampaya needs to fold up its natural gas platform.

The power sector of the country was privatized by the Electric Power Industry Reform Act (EPIRA) in 2001. The task of the DOE and other infrastructure regulators is to create a regulatory environment to attract private sector investments. In the following sections, the discussion takes up the likely applications of LNG here in the Philippines

and how the transformation to LNG is supported by a growing supply of liquefied fuel in the world.

This part of the Guide covers the likely investment areas in an LNG-based industry in the country over the next 25 years. It informs prospective investors about the potential applications of LNG in the country that may be highly demanded, and gives an outlook of LNG supply in the world.



NATURAL GAS INDUSTRY IN THE PHILIPPINES: AN OVERVIEW

The Malampaya gas field was discovered in 1991 with proven reserves of about 2.5 to 3.5 trillion cubic feet (tcf) of gas, 85 million barrels of condensate, and at least 20 to 40 million barrels of oil.¹ It is located 850 meters deep offshore northwest of Palawan province. It is nearest to Malampaya, an island situated in the West Philippine Sea. Owned by the government of the Philippines, the Malampaya gas field has been scheduled to produce 146 billion cubic feet (bcf) of gas per year.

A few years after the discovery of Malampaya, the Philippine government, through the National Power Corporation (NPC), entered into a Gas Sale and Purchase Agreement (GSPA) with Shell Philippines Exploration B.V. (SPEX) and Occidental Philippines, Inc. (OxyPhil) for the Ilijan Power Plant (1,200 MW). Moreover, SPEX, OxyPhil, and the DOE signed a Joint Declaration of Commerciality, confirming the commercialization of the natural gas reserves in the Camago-Malampaya and San Martin Gas Field. After these events, First Gas Power Corporation also entered into GSAs with Service Contract (SC) No. 38 contractors for the Santa Rita (1,000 MW) and San Lorenzo (500 MW) Power Plants.

In 2000, SPEX closed a ten-percent farm-in agreement with the Philippine National Oil Company - Exploration Corporation (PNOC-EC), reducing SPEX's interest in the project to 45%. SPEX, however, remains the developer and retains the operatorship of the project.

Malampaya was inaugurated and commissioned in 2001 at the onshore gas plant in Batangas after three years of fast-paced development. The actual commercial production began in 2002 with about 400 million standard cubic feet per day (mmscfd),

which was expected to last for 20 years at the time. It is currently fueling 3,200 MW of gas-fired power plants in Batangas.

The gas produced from the field is transported via a 504-km-by-24-in pipeline to Batangas. Malampaya has since become one of the country's major energy sources, accounting for 29.3% of the Luzon electricity power generation mix in 2018, which includes electricity generated from coal, oil, hydro, geothermal, and other renewable energy sources.

In 2016, the DOE estimated that the country would need to triple the existing installed generation capacity of 23,000 MW by 2040 to meet the country's anticipated energy needs, increase reserve margins, and support the government's massive infrastructure program. The country will therefore have to resort to other natural gas sources, given the expected depletion of the Malampaya gas field in the mid-2020s. New sources of indigenous gas may be discovered and developed over the next 25 years. While the Philippines has 25 tcf of natural gas reserves, the scale and timing of these potential expansions to the country's commercial gas supply are at best unpredictable at the start of the 2020s.

Importation of LNG remains the best option for the Philippines to avoid power shortages. Luzon will initially require 3.5 metric tons per annum (mtpa) of LNG for the existing 3,200-MW gas-fired power plants, but it could import more for the other potential downstream markets such as the industrial and transport sectors. Importing LNG requires capital-intensive investments in large-scale terminals with regasification facilities. This may pose a challenge at the start due to the limited market of LNG in the country. But, at the same time, the realized size of the local LNG market is constrained by the quantity of LNG that the country can import, which, as in a

¹ See <https://www.doe.gov.ph/natgas/malampaya-deep-water-gas-power-project>.

classic chicken-egg puzzle in development, requires large scale investments in terminals.

Developing the LNG market may be beneficial for the Philippines for the following reasons²:

1. Affordability. Opening the market to LNG imports could replace the gas supplied by Malampaya to ensure that electricity cost would not increase.

2. Energy security. LNG could be imported from different regions (US, Australia) unlike coal and oil, which the country mostly imports from a single source—Indonesia and the Middle East, respectively.

3. Sustainability. LNG is a much cleaner source of energy compared to coal. Using natural gas can help the country achieve its commitment to reduce greenhouse gas (GHG) emissions.

4. Competitiveness. The LNG market could foster competition as more players can enter the industry, which can consequently drive electricity costs down.

5. Business-ready. The government has already enacted Executive Order (EO) No. 30 Creating the Energy Investment Coordinating Council in Order to Streamline the Regulatory Procedures Affecting Energy Projects and Republic Act (RA) No. 11234 Energy Virtual One-Stop Shop (EVOSS) Act, which would both ensure more transparent, easier and faster transactions between the government and private investors.

USES OF NATURAL GAS

Most of the natural gas produced in the world today is used to generate electricity. The rest of it is used for heating, transportation, manufacturing,

and cogeneration and trigeneration. These uses are detailed in **Box 1**.

Box 1. Applications of natural gas in the world

Electricity Generation - The primary use for natural gas is to generate electrical power. Natural gas is the source of more than 25% of the nation's electricity. According to the US Energy Information Administration, in 2035, 46% of new generating capacity added to the grid will come from natural gas.

Heating - Heat produced from natural gas feels warmer than heat produced by an electrical pump. More than half of American homes use natural gas to provide heat, hot water and fuel for cooking. More businesses are turning to natural gas to heat office spaces too, as it is more cost effective than electric heating pumps.

Cogeneration and Trigeneration - Electrical energy and heating can be used simultaneously through the technological process of cogeneration or, in simpler terms, combined heat and power. Trigeneration is the combination of electricity, heating and cooling. Both processes can increase energy efficiency by 75 to 80 percent.

Transportation - Most people don't realize that natural gas has been used to power vehicles since the 1930's. Now, more than 150,000 vehicles on America's roads and more than 5 million worldwide are powered by natural gas. This number is expected to increase due to the popularity of natural gas as fuel for buses and trucks. Using natural gas

² Keynote presentation of Senator Sherwin Gatchalian at the GPDP Launch, December 7, 2018, Shangri-La The Fort, Taguig City, Philippines.

Box 1. Applications of natural gas in the world

in transportation reduces harmful emissions released into the air, which decreases smog pollution.

Manufacturing – Steel and paper production uses natural gas to generate process steam for industrial applications. Natural gas is also used for petrochemicals, which are incorporated in plastics, fertilizers, synthetic fibers, cosmetics and medicines.

Source: The Natural Gas Solutions. Accessed through <https://naturalgassolution.org/>

Besides generating electricity, about two percent³ of the natural gas from Malampaya is used by Pilipinas Shell Petroleum Corporation's (PSPC) oil refinery as fuel for its gas turbine generator and as supplement to its low-pressure fuel gas system.

Potential additional uses of natural gas in the Philippines would be in transportation, manufacturing, and residential cooking. Ten years ago, the Department of Energy deployed buses in the National Capital Region and Region IV-A that used compressed natural gas (CNG) as fuel. The project has yet to be mainstreamed.



Ilijan Power Plant. Photo courtesy of Kepco Ilijan Corporation.

GLOBAL GAS MARKET OUTLOOK⁴

Supply of Gas

Recent growth of the world's supply of natural gas has been significant. In 2016, the world produced 3,621 billion cubic meters (bcm) of natural gas.⁵ Output was projected to reach 4,174 bcm in 2025, and 5,304 bcm in 2040. Over the period of 2016 to 2040, the world's output will be growing at 70.125 bcm yearly, or at the compounded annual rate of 1.6%. The United States is the top contributor, accounting for 18.36% of the projected additional gas particularly in the period of 2016 to 2025. Other top contributors include Iran, Russia, and China.

Iran, Qatar, and Russia are the top producers of conventional gas. All three accounted for about 35% of output in 2016, and are expected to increase their share to 37% in 2040, or 1,382 bcm of conventional gas.

Unconventional natural gas accounted for about 20% of the total in 2016, and is expected to increase to 30% in 2040. The United States has emerged to be the largest producer of shale gas, producing 445 bcm in 2016, and is expected to nearly double its shale gas output in 2040. Over the next 20 years, other shale gas producers, Canada, China and Argentina, are expected to ramp up their outputs.

Demand for Gas

In **Figure 1**, gas is forecasted to be used up at the rate of 1.6% yearly from 2016 to 2040. Several factors, including low gas prices and the nature of gas as a relatively clean and flexible fossil fuel, have apparently shifted use preference for gas. In their respective efforts to lower the carbon footprint of their energy use and air pollution,

³ 2017 domestic consumption of natural gas per sector. Source: DOE.

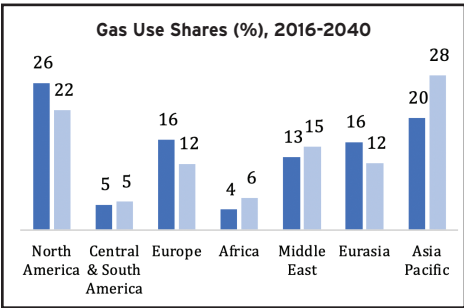
⁴ The data and information in this section are drawn from World Energy Outlook (WEO) 2017 Excerpt – Focus on Natural Gas.

⁵ See Table 8.3 of WEO 2017 Excerpt. The numbers cited are not for a particular year, but some average of a 25-year outlook period.

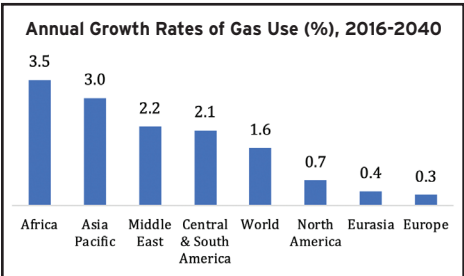
China and India have been actively replacing coal and oil with gas. The development pushes up gas's share in the global energy demand to 25% over the period of 2016 to 2040.

In 2016, North America accounted for 26.4% of total use of natural gas. The Asia Pacific region followed with a fifth of total use accounted. Europe and Eurasia were close third and fourth top users. Over the outlook period, the pattern shows a marked change. By 2040, the Asia Pacific countries are expected to gain the largest share of 28%, surpassing North America, with 22% of the projected use of gas in 2040. The Middle East is a far third at 15%.

Figure 1. Gas use shares and annual growth rates, 2016-2040, by region



Source: World Energy Outlook, 2017, Excerpt



Source: World Energy Outlook, 2017, Excerpt

The growth of demand for gas is projected to be fastest in Africa - 3.5% per year over the outlook period. The Asia Pacific region comes second with 3% growth. The current top users of gas have only less than a percent of growth over the outlook period.

The world's market of gas is going to see deeper and broader participation of developing countries. India and China are projected to be increasing their use of gas at the respective rates of 4.6% and 5.2% yearly. Both are developing and happen to be among the largest countries in terms of population and economies. While the United States is the third largest contributor to the added demand over the outlook period, the yearly growth of its use of gas is only half a percent. Japan's demand is observed to go down, apparently influenced by its decision on partly restoring its use of nuclear energy. South Africa and Brazil come after China and India as countries with the third and fourth most fast-growing demands, respectively. The use of gas in Southeast Asia is expected to grow at 1.9% yearly, higher than the world's growth at 1.6%. About 80% of the increased use of gas will come from emerging economies.

Gas Trade, Liquefaction, and Storage

International trade in natural gas is expected to expand at the rate of 2.4% annually in the outlook period with major importing regions such as the European Union, China, Japan, Korea and with other Asia Pacific countries, increasing their net imports in the period. **Table 1** depicts the net trades in LNG of key regions in the world. By 2040, at least 40% of the demand of Asia and Pacific countries for natural gas will be imported. On the other hand, Russia, North America, the Middle East, and Australia are among the top net exporting countries. In 2040, at least 14% of their gas output is expected to be exported. Sixty-eight percent of Australia's output will be exported to the Asia Pacific region. Over the

outlook period, an additional 525 bcm of gas will be traded internationally.

The rapid growth of international trade is made possible because of the liquefaction of natural gas and shipping. Gas can be transported from production site to end users through offshore or onshore pipelines. Malampaya gas is brought to Batangas, which is about 504 km away, through offshore pipelines.

Table 1. Net trades in LNG, 2016-2040, by region

Net importing regions in 2040	Net imports (bcm)		
	2016	2025	2040
European Union	-329	-374	-389
China	-73	-177	-278
Other Asia Pacific	52	-47	-178
Japan and Korea	-165	-150	-181
India	-24	-55	-99
Other Europe	24	9	-18
Net exporting regions in 2040	Net exports (bcm)		
	2016	2025	2040
Russia	188	265	314
North America	-1	119	192
Middle East	108	134	201
Caspian	80	87	140
Australia	45	100	137
Sub-Saharan Africa	29	48	106
North Africa	42	49	47
Central and South America	10	-6	5

Source: World Energy Outlook, 2017, Excerpt

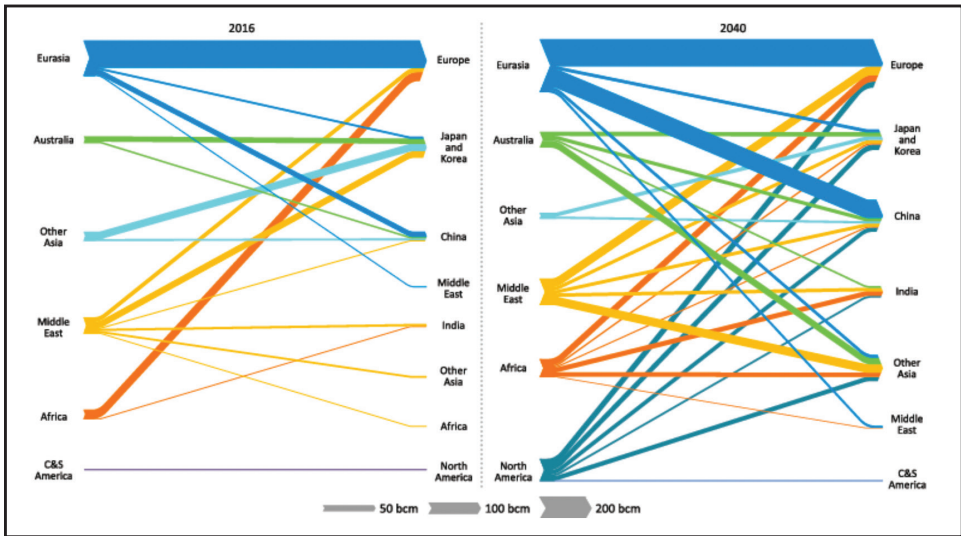
However, longer distances, such as from the United States to the Philippines, may require shipping the fuel as LNG. In liquid form, natural gas is 600 times lighter than in its original state. Liquefaction facilities are critical in the expansion of gas trade, and there is an ongoing boom in LNG investments, most in the United States and Australia. Together, about 140 bcm in liquefaction capacity is expected to be available in the present decade.

International shipping of LNG from exporting to importing countries requires LNG carriers. Innovations in shipping and storage have been developed to enable ocean-going ships or tankers to carry LNG onboard in super-cooled (cryogenic) tanks. And at the receiving end in importing countries, LNG is unloaded into large cryogenic storage tanks, where it is stored before it is regasified and used. These infrastructure facilities boosted the trade of natural gas across long distances, where pipelines cannot serve efficiently.

Given these developments, international trade in natural gas is projected to become more diverse and deeper. In **Figure 2**, the number and destinations of gas flows from exporting to importing countries are expected to grow and deepen. In 2016, other Asian countries including the Philippines imported LNG from only one source, the Middle East. The number of routes is projected to increase by 2040. Moreover, the flow of LNG from the Middle East expanded between the two years. In another instance, the deepening of trade flow from Eurasia to China can be observed in the figure. There is also a shallowing of flow. In this case, Japan and Korea had a deeper gas flow from Other Asia in 2016, but this is expected to thin out in 2040. The development may be explained by Japan's diversifying back to nuclear power for its energy requirement, and possibly the drying up of gas sources in Indonesia or Malaysia. But this is more than offset by the diversification and deepening of gas trade flows between 2016 and 2040.

The diversification and deepening of global LNG trade in the outlook period are the results of significant investments in two types of LNG terminals, namely those adjacent to a liquefaction facility and LNG storage tanks on the export side, and those with a regasification plant and storage in the importing economy. In the exporting country, gas is converted to liquid form by bringing down its temperature to -162 degree Celsius and is loaded into an LNG carrier

Figure 2. Global trade flows, 2016-2040



Source: World Energy Outlook, 2017, Excerpt

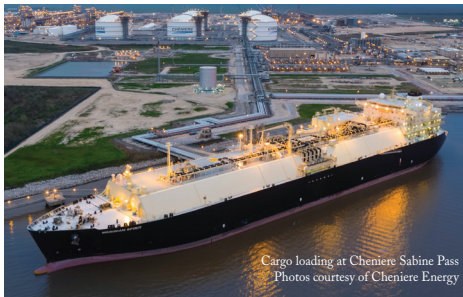
to be shipped to importing countries. Recent innovations are the floating liquefaction natural gas (FLNG), which converts gas from offshore wells into liquid form and transferred as LNG to LNG vessels.

About 140 bcm of liquefaction capacity is presently constructed mostly in the United States. This is the result of significant investments in liquefaction plants in that country. The current slump of LNG prices reflect the structural excess supply of LNG in the world market. Qatar and Australia are two other countries that invested in liquefaction facilities. By the middle of the 2020s, the US will become the largest exporter of LNG in the world, surpassing Qatar.

In the importing end of gas trade are LNG terminals built with regasification and special storage facilities for LNG. Land-based terminals are the combination of a jetty where LNG is unloaded from LNG ships, the storage tank, and the regasification

plant. Recent innovation of such terminals are the floating storage and regasification unit (FSRU). These terminals are connected to a gas-using facility like a power plant through a pipeline. Importing countries appear to lag behind exporting countries in developing their terminals.





LNG Ships

An LNG carrier is used to transport LNG from exporting country to importing country and can carry up to 260,000 m³ of natural gas in liquid form. A Boil-Off Gas (BOG) recovery system and reliquefaction plant are onboard reliquefaction systems that recover BOG in LNG carriers and return it to the cargo tanks.⁶ In transit, about 0.15% of the LNG cargo boils off per day. Vessels are equipped to capture BOG and use it as fuel for the ship's steam turbine.

In anticipation of the fast growth of LNG trade in the early 2010s, orders of new LNG vessels were ratcheted up. This was driven by the rising charter or daily rental cost of the vessel in the period up to 2012. In 2011, there were only 340 LNG vessels; the number increased to 460 ships in 2016 and, by 2040, nearly 1,000 new vessels are expected. There is an oversupply of vessels at present, given that realized trade growth fell short of expectations.

PHILIPPINES IN THE LNG TRADE ROUTE

The Philippines has relatively easy access to multiple sources of supply of LNG, being situated in the Southeast Asia region where the biggest LNG suppliers and buyers are located. Three economies in this region, namely Australia, Indonesia and Malaysia, supplied about 34% of total world LNG

exports in 2018, while three other countries, namely Japan, China and South Korea, accounted for about 57% of total world LNG imports.

The Philippines can source its LNG supply from a number of net exporting LNG countries. But because of its strategic location, the country's more likely sources of LNG are its South East Asian neighbors, particularly Indonesia, Malaysia and Australia. However, with the emergence of LNG aggregator traders, the supply of LNG may come from anywhere in the world (see **Figure 3**).

The DOE encourages the balanced development of the natural gas industry in the country. It will continue to promote the exploration of new indigenous gas resources but at the same time import LNG. Between the two, LNG importation is likely to move ahead first compared to developing a new supply of indigenous natural gas.

LNG importation requires private sector investments in large receiving LNG terminals with regasification in Batangas where the gas-fired power plants are located. The set of large receiving terminals with gas-fired power plants is the most likely initial configuration of the downstream LNG industry of the country. The DOE has seen the urgency in pushing to put in place the necessary infrastructure such as the LNG import receiving facility so that the country can import and access LNG to ensure security of natural gas supply.

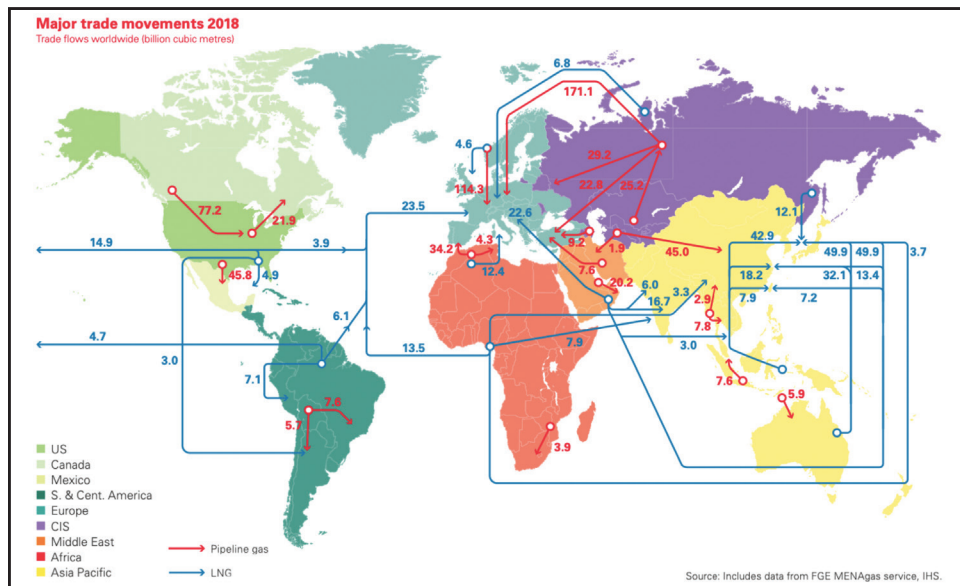
Infrastructure development in the energy and energy-related facilities is primarily done by the private sector in the country. The development of gas transmission and distribution pipeline networks, including their related facilities such as LNG terminals, CNG refilling stations and their respective ancillary facilities, are keys to the successful expanded use of natural gas as well

⁶ Source: Wärtsilä Encyclopedia of Marine Technology

as development of the downstream natural gas industry. The archipelagic nature of the Philippines dictates the need for a mix of modes in transporting natural gas to all the demand sectors in all the regions. Without this mix of infrastructure network, natural gas will not be as accessible to all the identified users in the power, transport, industrial

and commercial sectors. Critical gas infrastructure projects have been identified primarily in Luzon, where demand concentration for natural gas is projected to be the highest in the next ten years, and will expand to the Visayas and Mindanao regions and even to the off-grid islands located within the respective regions.

Figure 3. Philippines along the LNG trade route in East Asia⁷



PROSPECTIVE LNG-RELATED INVESTMENTS IN THE PHILIPPINES: AN OUTLOOK TO 2040

The potential LNG-related infrastructure investments in the Philippines may be gleaned from the LNG value chain of a typical LNG importing country (Figure 4). While the Philippines' need for natural gas is fully supplied at present with indigenous gas from Malampaya, the figure excludes this fact since, in about five years, the

available supply of indigenous gas will be reduced to less than its current supply capacity. In the value chain depicted, it is assumed that in the next two decades, no new supply of indigenous gas can be developed.

LNG Value Chain of the Philippines

LNG is brought to the country from an LNG exporting country in large LNG ships and unloaded into large

⁷ Figure source: BP 2019 Statistical Review of World Energy



cryogenic tanks. These tanks and the facilities in their vicinity are sometimes referred to as LNG receiving terminals. The tanks are specially designed to store the liquefied fuel until it is regasified on ship and pumped to an onshore receiving facility where it is metered, odorized, and analyzed before it is used as fuel or transmitted in pipelines to facilities outside the terminal complex. Alternatively, the LNG may be loaded into smaller LNG ships or trucks to be delivered to smaller LNG storage tanks.

The LNG storage and regasification facilities can be land-based or offshore. In the latter case, they are called FSRUs. The FSRUs are designed to store and regasify LNG and send the gas by pipelines to an off-take station (OTS) like a gas-fired power plant. Alternatively, the gas may be pumped into transmission pipelines to be brought to an OTS outside the vicinity of the FSRU.

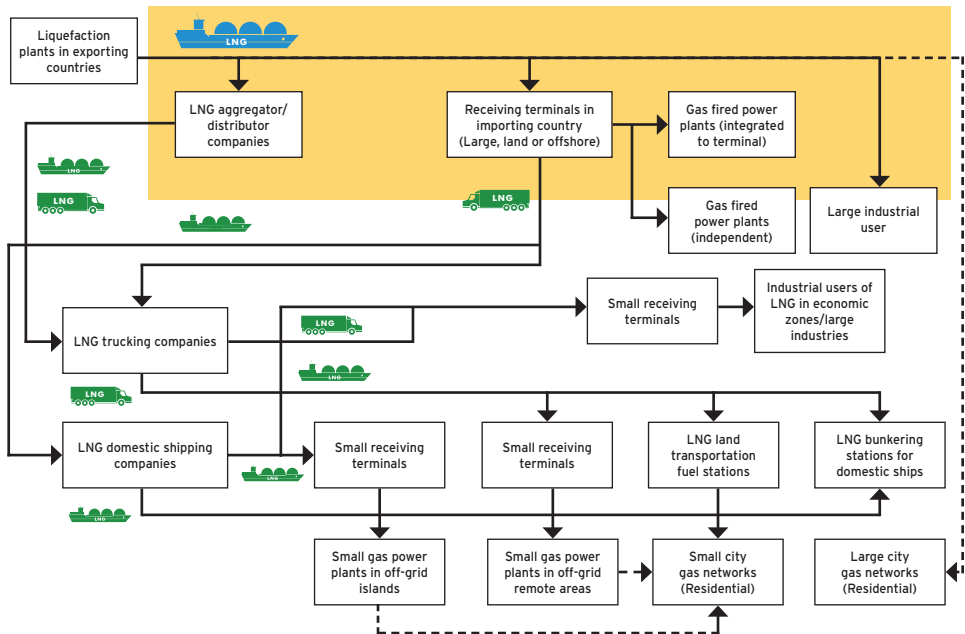
On the other hand, the LNG carrier may deliver the LNG to a land-based terminal with docking and unloading facilities. It unloads the LNG to onshore cryogenic storage tanks. As the need for gas arises, the LNG will be regasified, metered, odorized, and analyzed prior to its send-off to a user or a transmission system. From the transmission system, it will then be distributed via pipelines to various industries such as power, commercial, residential and transportation.

Figure 5 presents the LNG value chain just described as functions within the chain, i.e., in terms of suppliers, transporters or users of LNG. The functional schematic value chain is used to extract the potential LNG investments that may be expected as the value chain develops. In a box depicting a particular function, there may be several businesses serving the function.

Figure 4. A typical LNG value chain of an importing country



Figure 5. Schematic functional LNG value chain



Large LNG Investments

In an LNG importing country such as the Philippines, the key infrastructure is the receiving LNG terminal, which includes a regasification facility, storage tank, and ancillary infrastructure, including a jetty, LNG receiving arms, and short-distance distribution pipelines within the complex. The terminal may either be land-based or floating. Like its land-based counterpart, floating terminals have storage tanks, a regasification plant, and ancillary infrastructure connected to a gas-fired power generation plant. Infrastructure for loading LNG into trucks or smaller domestic LNG ships may be added to the ancillary infrastructure of an LNG terminal.

LNG for Power

The LNG terminal investment is key, since on it depends all the other LNG investments in the value chain of an importing country. The LNG terminal is large and the most expensive investment in the value chain. Based on the standards of the International Gas Union, its storage capacity is at least an mtpa in terms of its oil equivalent. The LNG terminal business is typically integrated with a power generation plant. This reflects that power is the likely top use of LNG in the Philippines. The typical capacity of the power plant runs in hundreds of megawatts. All the gas-fired plants in Batangas City, which are fueled with indigenous gas, have a total capacity of 3.2 gigawatts.

With the economy growing at six percent, the 2017-2040 Power Development Plan projects that

Table 2. Additional power capacities, 2017-2040 (in MW)

Capacity Addition	Luzon	Visayas	Mindanao	Total by Type
Baseload (coal, geothermal, natural gas*, nuclear, biomass* & hydro*)	13,635	5,330	6,300	25,265
Mid-merit (natural gas and all others)	8,300	3,000	3,200	14,500
Peaking (oil, wind** & solar PV**)	2,450	850	700	4,000
Total per grid	24,385	9,180	10,200	43,765

Notes: At 70-20-10 baseload, mid-merit, peaking requirement; *natural gas is currently considered as baseload but belongs to mid-merit category; biomass is baseload only during availability of feedstock; hydro is baseload only during rainy season; **wind and solar PV output are subject to availability.

Source: DOE, 2016

43,765 MW additional capacity will be needed by 2040. **Table 2** shows the capacity requirement per grid. LNG can supply baseload, mid-merit and peaking requirements. It is price-competitive and can compete with other fuel sources.

The LNG stored in the terminal is for own use as fuel for the power plant in the terminal complex. The LNG is converted back to gas using the regasification facility and brought to the power plant using a distribution pipeline in the complex. The integrated operation may be necessary to reduce market risk of at least a billion-dollar investment in the terminal at current costs.

The storage capacity of the terminal may exceed the requirement for own use. The surplus LNG is sold to distributors of LNG. For the terminal to sell to third-party users of LNG, the terminal complex is equipped with LNG loading infrastructure for either small LNG transporters like LNG trucks or domestic ships.

The third-party transactions represent one type of domestic market of LNG in the importing country between the LNG terminal company and the LNG distribution businesses. However, it should be pointed out that this does not rule out

the distributors being special purpose businesses completely owned by the terminal owner or in joint venture with a third company. But if these distribution companies are related businesses to the terminal company, market competition may require that own use in distribution businesses should not prevent any third party from having access to the surplus LNG of the terminal.

Foreign Aggregator

LNG aggregation can be a viable business option, particularly if importing LNG in the wider world market requires larger capital and know-how about the market to effectively deal with fluctuations of LNG prices and other market risks. The aggregator company acts like a large terminal company, which can sell LNG to third parties. A variation of this is for a foreign LNG company to set up a local subsidiary and import LNG in smaller scale, particularly if the source is relatively near the country.

Small-Scale LNG (SSLNG) Businesses

The distributors are themselves described as satellite facilities or those that handle LNG supplied from large terminals. Two types of domestic LNG distributors

are expected in an archipelagic country like the Philippines. One type makes use of LNG trucks in bringing the LNG to users, and the other transports LNG on inter-island ships. Distributors must have their own smaller LNG storage tanks, receiving and loading facilities. For inter-island distribution, a small jetty is part of the requirement to set up the business.

The domestic LNG distributors may be classified as small LNG businesses. Following International Gas Union (IGU) standards, the LNG carriers they use have a capacity of no more than 60,000 m³. Maneuverability of ships in smaller islands is limited, and both the receiving terminals and power plants are themselves small because of the limited size of the domestic markets that they serve. In **Figure 5**, the SSLNG are those facilities in the shaded area.

There are five types of domestic markets of LNG that the distributors can serve, all of them SSLNG businesses. These are discussed below.⁸

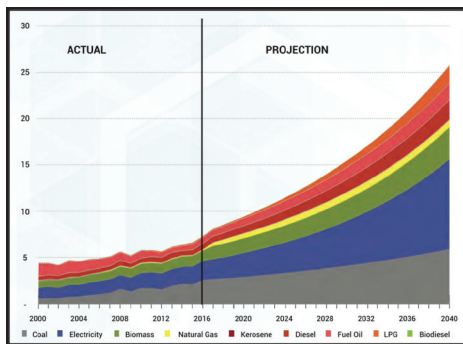
Industrial Use

The first one comprises industrial users, such as those in economic zones, or large manufacturing companies that burn fuels for their businesses like boilers. Existing industrial users are using diesel for generating steam or running steam turbines. Because of the environmental benefits of using gas, the industrial use of LNG is to replace diesel as fuel.

Natural gas in this sector is usually used as a power source and for furnaces. However, natural gas is expected to figure prominently as fuel in emerging ecozones as well as in industrial parks as reflected in **Figure 6**.

The government's *Manufacturing Resurgence Program* envisions the creation of a globally

Figure 6. Industry energy demand by fuel, 2000-2040 (in mtoe)



Source: DOE Energy Demand and Supply Outlook 2017-2040.

competitive manufacturing industry with strong forward and backward linkages to serve as hubs in the regional and international production network of automotive, electronics, garments and food.⁹ LNG can provide energy to industries in economic parks in Cavite, Batangas, and Bataan to meet requirements for heat, air conditioning and power. The Batangas-Manila industrial corridor, with its 20 industrial parks or economic zones, can tap gas for their various needs.

Clark Special Economic Zone in Pampanga and Subic Freeport Zone in Olongapo are also potential users of gas. Both economic zones host numerous industries that have stringent requirements for quality electric power and heating. These parks are ideal candidates for industrial gas distribution as they are sensitive to pricing differentials between natural gas and purchased power.

Gas-Fired Power Plants For Small Islands

The second market of the distributors are small gas-fired power plants in off-grid islands. The islands with power are likely getting their

⁸ Source: DOE Energy Demand and Supply Outlook 2017-2040

⁹ See more in DOE's Philippine Energy Plan 2017-2040.

electricity from diesel-fired plants. These plants are old and need to be replaced to generate electricity efficiently and bring down electricity tariffs. If the owners have to convert to modernize their plants, gas-fired plants are good replacements. Some of these plants may be operated by electricity cooperatives.

But there are islands that have access to grid power, like Bohol, that are considering expanding their power sources by building their own power plants to partially supply their requirement. When Typhoon Yolanda temporarily rendered the grid in the Visayas inoperable, Bohol residents were simply without power for days. Thus, it is not only off-grid islands that need gas-fired plants.

Small Powerplants In Remote Areas

The third market comprises small power plants in remote areas on the mainland not reached by the power grid because their small markets do not pay off the relatively high cost of connecting these areas to the grid. Similar to off-grid islands, the small power plants are likely operating using diesel as fuel. These old power generation plants can become more efficient and generation costs reduced if these plants are converted to using gas. Their respective generation capacities can be in scores of megawatts per year. The majority of these are operated and owned by electric cooperatives.

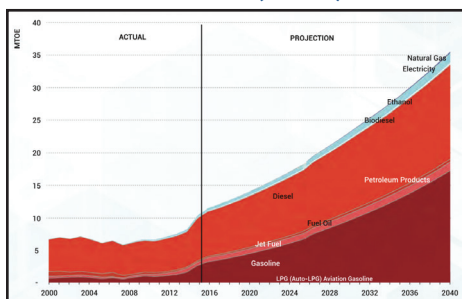
Transport Sector

The fourth and fifth markets are fuel stations for compressed LNG to be used in land transportation and for bunkering stations for domestic ships. As the government pursues an aggressive transport infrastructure under the *Build, Build, Build initiative*, the energy share of transport is expected to grow. The transport

sector has a huge part of the country's total energy demand, with an annual average share of 38.2% in the total final energy consumption and projected to grow at an annual rate of 4.5% (Figure 7). The demand of 12.3 mtoe in 2016 is expected to grow to 35.5 mtoe in 2040 and will be used mainly for land transport. This is about 80% of the domestic traffic and 60% of freight traffic by land.¹⁰

The increased energy utilization for transportation however poses a challenge to the country's initiative to promote environment-friendly fuels. The application of compressed natural gas in public transport vehicles such as buses, taxis and jeepneys is seen to help the country's development and environmental objectives.

Figure 7. Transport energy demand by fuel, 2000-2040 (in mtoe)



Source: DOE Energy Demand and Supply Outlook 2017-2040.

The use of CNG in the public transport sector has been introduced in 2002 through the Natural Gas Vehicle Program for Public Transport (NGVPPT), which aimed to convert up to 100 public transport buses or import the same number of Original Equipment Manufactured (OEM) buses to run on CNG by 2003. However, the pilot project ceased operation after its eight-year term due to problems on supply sustainability and infrastructure capability. With the targeted commercialization of CNG-vehicles nationwide,

¹⁰ See more in DOE's Philippine Energy Plan 2017-2040.

natural gas use in the transport sector will reach 27 thousand tons oil equivalent (ktoe) by 2040, from a nil value in 2016 as shown in **Figure 7** in the previous page.

The above five types of SSLNG businesses are themselves like LNG terminal complexes, replete with storage tanks, receiving/loading facilities for LNG, distribution pipelines, and related infrastructure, except at a reduced scale.

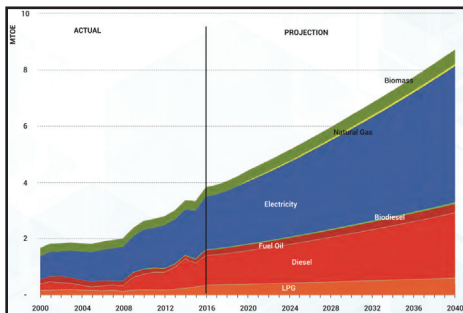
In the value chain depicted in **Figure 5**, gas distribution from large terminals to SSLNG facilities is assumed to be more cost effective with trucking and domestic shipping compared to with transmission pipelines. Distribution pipelines are still used as part of the overall infrastructure of a large terminal complex or in small scale gas-fired power plants, but delivery of LNG to these small-scale gas plants from large LNG storage and regasification terminals is done at lower cost by LNG trucks or inter-island ships.

City gas distribution businesses for residential communities or for clusters of manufacturing companies located in areas far from large LNG terminals may likely require conventional or virtual pipelines (land or sea transport). LNG can be potentially used in residential and commercial areas as an alternative to electricity for air-conditioning, lighting, and substitute for cooking. Given the growing demand from commercial sectors, the aggregate energy requirement is expected to increase at an average rate of 3.5% from 3.9 mtoe in 2016 to 8.8 mtoe in 2040. It is expected to figure in the commercial sector's demand mix at 68 ktoe by 2040. **Figure 8** shows the details.



Photo courtesy of Energy World Corporation, Pagbilao, Quezon

Figure 8. Commercial energy demand by fuel, 2000-2040 (in mtoe)



Source: DOE Energy Demand and Supply Outlook 2017-2040.

The technology of deploying gas for these purposes may require piping the gas from regasification units to use areas. However, trucking the gas to receiving storage tanks linked to the gas network may also be an option. These alternative approaches to give access to LNG for this purpose are depicted in **Figure 5** with dashed lines.

Box 2 in the next page summarizes the large and small LNG investments.

Box 2. Potential businesses on the LNG value chain

Large LNG investments

- 1. Land-based large receiving LNG terminals.** A complex of related investments in large storage tanks specially designed for LNG at least 1 mtpa in oil equivalent; regasification facility; jetty with loading and receiving arms; distribution pipelines; gas power plants; and ancillary facilities.
- 2. Large floating storage and regasification unit (FSRU).** An offshore LNG terminal with similar set of infrastructure as land-based receiving terminals. Upfront capital spending is limited as FSRUs can be leased on a long-term basis. FSRUs can be set up in less than two years.
- 3. Aggregator LNG importer.** This may also have the same set up as receiving terminals, but primarily caters to small scale third-party purchasers of LNG from large receiving terminals.

Small-Scale LNG (SSLNG) businesses

- 1. Land-based LNG distributors.** They buy LNG from large terminal operators or LNG aggregators and sell the LNG to any of the SSLNG users below. They have facilities similar to terminals like storage tanks, LNG trucks, receiving and loading facilities, and ancillary facilities. Following IGU standards, the capacity of LNG trucks is at most 60,000 m³.
- 2. Domestic LNG shipping companies.** These companies have facilities similar to land-based LNG distributors, but have access to LNG shipping services and invest in jetties. They purchase from large terminal companies or aggregators/importers of LNG, and ship LNG in domestic LNG carriers. Capacity: at most 60,000 m³.
- 3. Small-scale gas power plants in off-grid islands** (including islands in the power grid where residents prefer to have own power generation capacity).
- 4. Small-scale gas power plants in remote off-grid areas with limited markets.** These businesses have their own storage, regasification facility, distribution pipelines, and, if LNG is delivered by domestic LNG ships, a jetty with receiving facilities.
- 5. Compressed LNG fuel stations.** These businesses purchase LNG from distributors and operate facilities for compressing LNG for use in land transportation.
- 6. LNG bunkering stations.** These companies purchase LNG from distributors and operate fuel stations where domestic ships using natural gas can obtain LNG.

Possible additional LNG facilities

1. City gas networks
2. Transmission pipelines
3. LNG land transportation vehicles and domestic ships using gas as fuels

POSSIBLE LNG INVESTMENT PRIORITIES

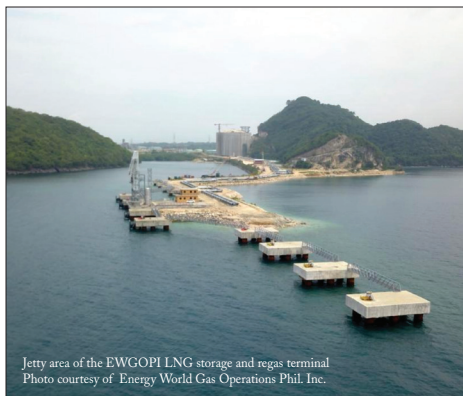
The Philippines is likely to remain using natural gas primarily for generating electricity in the next 25 years. Since 2001, it has been using about 95% of its indigenous gas from Malampaya for energy. With the expected depletion of Malampaya starting in less than five years, and the high cost of using alternative fuels for replacing natural gas fuel for the 3,200 MW of gas-fired power plants in Batangas City, importing LNG turns out to be the most effective option for energy security.

The priority of government is to increase the supply of electricity and reduce its price considering the Philippines has had among the highest electricity tariffs in East Asia. But it may also be that the Philippines has lagged behind building power generation capacity in step with the requirements of economic growth. The high cost of power has been among the reasons why investors had bypassed the country or moved to other host countries. With the government's focus of attaining its 2040 vision to become an upper middle-income country¹¹, its economy has to grow by at least 7% yearly and, to help attain this objective, installed electricity power generation capacity has to grow from 18.2 GW in 2015 to about 49 GW in 2040, which translates to a 269% expansion of existing capacity in 2015, according to a study by Ravago et al. (2018).

Ravago et al. (2018) pointed out that letting the market choose the least cost fossil fuel, appropriately adjusted for emissions cost of the competitively priced coal, is the most feasible approach towards reducing the electricity generation cost through the outlook period of *Ambisyon 2040*. While power plants using renewable energies (REs) are the cleanest and have virtually zero variable cost

compared to fossil fuels, the comparison is uneven given the disadvantage of REs in the lack of cost-effective batteries to circumvent their supply intermittency problem. In addition, renewables including conventional hydropower and geothermal power plants tend to be area-specific, which raises the cost of integrating the power that they produce into the grid. The wind power mills in Ilocos Norte or the biogas power in Negros have to wait years before the grid company is able to connect them to the grid.

Prospect of Natural Gas Use in the Power Sector



Natural gas is not explicitly considered in the analysis of Ravago et al. (2018). Their analysis may have implicitly assumed that the 3.2-GW capacity in Batangas city would continue to have access to indigenous gas or imported LNG. The growth of that capacity could grow in step with the rest of the industry, or remain frozen where it is right now. The analysis is agnostic in the mix provided what comes out is not dictated by policy but the result of market competition of fuels, the use of which is regulated to reduce the country's power sector

¹¹ The program is dubbed as *Ambisyon 2040*. The Philippines, as of 2015, has been a lower middle-income country, with a per capita income of \$3,500 and a household poverty rate of 25%. In a quarter of a century, the program aims to raise per-capita income to a level of at least an upper middle-income country, and reduce its poverty problem significantly. Successive six-year mid-term Philippine development plans of the government are set up to realize this development objective.

carbon footprint. However, given the market-driven fuel mix of the country's electricity generation capacity, there is need to explicitly ask the question if natural gas has an assured role in the power sector over the next two decades.

It would seem so from the initial excitement of investors in LNG terminal capacity. Over the last two years, after the DOE issued its circular on the Philippine downstream natural gas industry¹², investors took up the challenge of phasing away indigenous gas from Malampaya and substituting it with imported LNG. There are other investors, which without present offtake agreement in any gas-fired power plant they own, take the risk in expanding the use of natural gas beyond electricity generation.

The construction of an LNG terminal complex is highly capital intensive, requiring about a million US dollars per mtpa as a rule of thumb.

There are several approaches to reducing the capital investment bill of large receiving LNG terminals or mitigating the market risk of investors, each having their own advantages and disadvantages:

1. Leasing an FSRU facility, or scaling appropriately the capacity to minimize risk of underutilization of capacity. However, the latter depends upon the nature of available power plants but, more importantly, if the business is into importing LNG, the business may be better off having a large receiving LNG terminal to reduce the import cost. Large terminals are at least an mtpa. Having own use of it, the gas for generating electricity can contribute to reducing market risk, but sizing the scale of the terminal for own use forgoes the potential of the terminal business to also sell to third-party users. An FSRU is a good starting idea because the initial

capital expense is limited, and it can be more scalable than land-based terminals. But they also have the requirement of moving them into safe areas during typhoons, which regularly visit the country.

2. Investors in large scale terminals prefer a prescriptive fuel mix in favor of gas to mitigate the market risk of gas over coal. Without adequate supply of LNG, downstream investments in SSLNG dependent on the available LNG supply in country may not be realized.

3. However, explicitly regulating the mix of fuels to favor gas may go against the current technology-neutral policy of the Department of Energy. As Ravago et al. (2018) noted, a prescriptive technology-biased energy mix can be inconsistent with the implied goals of *Ambisyon 2040* of reducing the cost of power so as to encourage investments in the economy and ensure the attainment of the seven percent growth target. Clarete (2018) had observed that coal would continue to have the probabilistic comparative advantage over natural gas in the baseload use of these fuels. Under a gas-biased mix policy, the cost disadvantage of gas-fueled electricity can be passed on to users.

4. From the second half of the last decade and likely stretching into the first half of the current decade, LNG prices delivered to destination countries have been competitive. If investors in LNG power lock themselves up in long-term contracts, this has the advantage of reducing their vulnerability to risk of rising LNG prices in the rest of the outlook period. But the trend these days is that long-term contracts, like what the Japanese had done on their purchases of LNG from the Middle East, may give way to shorter-term gas purchase agreements. The

¹² See DOE Department Circular 2017-11-0012.

LNG market in the world has become more versatile, with the growing role of aggregators and traders, as well as moving towards treating LNG as a commodity, thus the need for long-term contracts has become weaker.

Unlike in other countries, the electricity industry in the Philippines is private-sector driven. If the gas-fired plants in Batangas survived a quarter of a century of competition with coal despite the underlying comparative disadvantage of gas, that is because the government had brokered a contract between the fuel producer, the power plant owner, and the distribution utility to agree over a period of 25 years to make use of the indigenous gas from Malampaya. The agreement effectively transferred the risk to the distribution utility, whose business is regulated. Fairhurst (2014) documented that the distribution utility may have lost \$300 million because it could not switch to cheaper electricity from coal plants.

In the analysis by Fairhurst (2014) and Clarete (2018), natural gas is competitive over coal, given trends in world prices of fossil fuels, in mid-merit to peaking, and not in baseload operations. Coal delivers the lowest electricity price on 24/7 basis because of its lower normalized price compared to gas. Because of its cost disadvantage due to liquefaction and shipping, natural gas use for power in importing countries significantly far from source is probabilistically higher than coal. This may change with the increasing integration of LNG markets in the world, but the integration process may take some time and, in the meantime, investments in coal power plants continue to be attractive.

However, natural gas can gain wider market over coal in power even without the government prescribing the energy mix in its favor. If gas investors combine with variable renewables, which have virtually zero variable costs, then the average variable cost of a combination of LNG and solar or



wind power can beat coal in baseload operations. This is possible because of the flexibility of gas-fired plants, which coal plants do not have.

If part of the baseload operations in the country's energy system is by generation companies with LNG cum renewables as fuels, then the carbon footprint of the country's energy system is reduced not by government prescription but through markets.

Avion natural gas-fired power plant
Photo courtesy of First Gen Corporation



2

THE PHILIPPINE DOWNSTREAM NATURAL GAS INDUSTRY REGULATORY FRAMEWORK



The Department of Energy (DOE) promulgated Department Circular (DC) No. 2002-08-005 titled "Interim Rules and Regulations Governing the Transmission, Distribution and Supply of Natural Gas" a year after the Malampaya was inaugurated and commissioned in 2001 to facilitate the development of the emerging downstream natural gas industry in the country. The circular focused on regulating activities associated with the transmission and distribution facilities and supply of natural gas to consumers. It was drafted to immediately develop transmission and distribution infrastructures for the indigenous natural gas supplied by the Malampaya.

Activities and facilities on liquefied natural gas (LNG) importation were briefly mentioned but not extensively discussed in terms of their regulation.

With the looming depletion of the Malampaya natural gas in mid-2020s, the DOE deemed it necessary to update the circular to cover aspects other than the regulation of natural gas pipelines as initially included in the interim rules. The DC No. 2017-11-0012 or the Philippine Downstream Natural Gas Regulation (PDNGR) was issued in November 2017 which covered siting, design, construction, expansion, rehabilitation, modification, operation,

and maintenance of downstream LNG projects. Said circular provided the regulatory framework for the downstream natural gas industry and to ensure security of supply and superseded DC No. 2002-08-005.

Aside from the circular, the downstream natural gas industry is covered by Republic Act (RA) No. 11032 or the “Ease of Doing Business and Efficient Government Service Delivery Act of 2018”, RA No. 11234 or the “Energy Virtual One-Stop Shop (EVOSS) Act” and Executive Order (EO) No. 30 or “Creating the Energy Investment Coordinating Council (EICC) in order to Streamline the Regulatory Procedures Affecting Energy Projects.” RA 11032 was enacted to streamline the bureaucratic process of government agencies in terms of processing submitted documents and providing other services to private individuals or groups. To complement this policy, the EVOSS Act was legislated to provide an online platform, which allows submission and synchronous processing of all required data and information on applications for permits and certifications of new projects on generation, transmission and distribution. On the other hand, EO 30 creates the council that will spearhead the coordination of government agencies to fast track energy investment initiatives particularly those that are deemed projects of national significance.

The financing, construction and operation of natural gas infrastructure projects in the Downstream Sector shall be left to the private sector, with the government limiting itself to the formulation and implementation of strategies and programs conducive to the industry’s growth. In instances where a strategic infrastructure project needs to be initiated, however, the government may take the lead investing role through the Philippine National Oil Company (PNOC) to spur project commencement.

DEPARTMENT CIRCULAR NO. 2017-11-0012

Rules and Regulations Governing the Philippine Downstream Natural Gas Industry

The PDNGR specifies the rules and regulations for siting, design, construction, expansion, rehabilitation, modification, operation, and maintenance of the downstream natural gas industry value chain to ensure the development of a mature LNG market that advances energy security and sustainability.

The circular covers industry compliance to policies, rules, standards, and best practices on the following:

1. Siting, design, construction, expansion, modification, operation, and maintenance of any project necessary to the development of the Philippine Downstream Natural Gas Industry (PDNGI) value chain;
2. Importation of LNG and the supply and transport of the following:
 - a. Imported LNG or liquefied indigenous natural gas from the connection point of the loading arm to the LNG terminal, the transmission system, and the distribution system;
 - b. Indigenous natural gas after the point of sale up to the customer; and
 - c. LNG from the filling connection of the storage specifically used for reticulation or delivery up to the satellite LNG terminal in the Philippines and foreign market;
3. Third-party access (TPA);
4. The development of the Philippines as an LNG trading and transshipment hub for the Asia-Pacific Region;
5. Overall monitoring and supervision of the activities of the PDNGI value chain.

The circular also provides the DOE with the overall responsibility on the promotion and the supervision of the development and operation of the PDNGI value chain through:

1. The evaluation of applications for the issuance of authority to operators of 1) Notice to Proceed (NTP); 2) Permit to Construct, Expand, Rehabilitate, and Modify (PCERM); and 3) Permit to Operate and Maintain (POM) downstream natural gas facilities;
2. The issuance, among others, of Acknowledgement to Import (ATI) LNG and Acknowledgement to Supply and Transport (AST) Natural Gas;
3. The issuance of directives to qualified government agencies, in their capacities as investing arms, to spearhead the development of the PDNGI value chain when the DOE deems it imperative to enjoin the agencies within a specified timeline.

The circular also details the implementation of compliance to the local or international standards on natural gas product, downstream natural gas facilities, and industry practices. Specifically, it includes:

1. The creation of a Downstream Natural Gas Review and Evaluation Committee (DNG-REC)¹³ which shall evaluate and recommend, for the approval of the Energy Secretary, applications referred to in the Permit Application Guideline. This also includes the conduct of downstream inspection and monitoring activities in coordination with a Philippine Interagency Health, Safety, Security and Environment Inspection and Monitoring Team (PIA HSSE IMT) and the creation of Technical Committees (TC) which shall formulate applicable standards. The PIA HSSE IMT and the TC shall be both chaired by the DOE;

2. The recommendation of the DNG-REC regarding approvals of Memorandum of Agreement (MOA) or Joint Circular, whenever necessary, to concerned heads of agencies; and
3. The implementation of all other necessary measures allowed under existing laws, rules and regulations.

REPUBLIC ACT NO. 11032

Ease of Doing Business and Efficient Government Service Delivery Act of 2018

RA 11032 promotes the simplification of requirements and procedures to reduce red tape and to expedite business- and non-business-related transactions in the government. Under this law, each government agency, including the DOE, shall classify their processes or services into simple, complex, and highly technical transactions and must submit the same to the DOE based on the criteria provided. Highly technical transactions such as those concerning LNG facilities shall in no case be processed longer than twenty (20) working days, or as determined by the government and instrumentality concerned.

REPUBLIC ACT NO. 11234

An Act Establishing the Energy Virtual One-Stop Shop (EVOSS) for the Purpose of Streamlining the Permitting Process of Power Generation, Transmission and Distribution Projects

The EVOSS Act aims to ensure timely completion of power generation, transmission, or distribution projects by eliminating duplication, redundancy, and overlapping mandates in documentary submissions and processes by supplying an online platform for government agencies to coordinate and share information. It also hopes to provide a paperless and electronic application and processing system

¹³ See Annex 1 for the Department Order (DO) No. 2018-03-0003 or the Creation of a Centralized Review and Evaluation Committee for the Purpose of Integrating the Current Committees Administering the Review and Evaluation of Renewable Energy, Petroleum, Downstream Natural Gas, and Coal Service Contract Applications, the Award, Amendment, and Termination of Contracts.

which serves as a single gateway through which proponents can access all information necessary in the application for new generation, transmission or distribution project, submit all requirements related to the application, and monitor the approval of such application.

EXECUTIVE ORDER NO. 30

Creating the Energy Investment Coordinating Council in order to Streamline the Regulatory Procedures Affecting Energy Projects

EO 30 specifies the creation of an EICC that will spearhead and coordinate national government

efforts to harmonize, integrate, and streamline regulatory processes, requirements, and forms relevant to the development of energy investments in the country, primarily with regard to Energy Projects of National Significance (EPNS). It also aims to uphold transparency and accountability among concerned agencies.

Aside from these, **Table 3** below summarizes some of the supporting regulations, policies and legislations which support and govern the importation of liquefied natural gas. These were identified based on interviews and discussions with key agencies.

Table 3. Policies that guide the development and importation of LNG

AGENCY	GUIDING POLICY/REGULATION/LAW
BUREAU OF FIRE PROTECTION	2019 Revised IRR of RA 9514 (Fire Code of the Philippines of 2008)
	Republic Act No. 9514 (Fire Code of the Philippines of 2008) and its Revised Implementing Rules and Regulation
CIVIL AVIATION AUTHORITY OF THE PHILIPPINES	Republic Act 9497 (Civil Aviation Authority Act of 2008)
DEPARTMENT OF AGRARIAN REFORM	Republic Act No. 6657 (Comprehensive Agrarian Reform Law of 1988) As Amended
DEPARTMENT OF ENERGY	Department Circular No. 2017-11-0012 (Philippine Downstream Natural Gas Regulation)
	Department Circular No. 2019-02-004 (Implementing the Natural Gas Standard for all Natural Gas Supply in the Philippines)
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES	Commonwealth Act No. 141 (Public Land Act)
	DENR Administrative Order No. 2003-30 Implementing Rules and Regulations for the Philippine Environmental Impact Statement System
	DENR Administrative Order No. 99-34 (Rules and Regulations Governing the Administration, Management and Development of Foreshore Areas, Marshy Lands and Other Lands Bordering Bodies of Water)
	Presidential Decree No. 1586 (Establishing an Environmental Impact Statement System, Including Other Environmental Management Related Measures and for Other Purposes)

Table 3. Policies that guide the development and importation of LNG

AGENCY	GUIDING POLICY/REGULATION/LAW
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES	Presidential Decree No. 705, s. 1975 (Revising Presidential Decree No. 389 or Forestry Reform Code of the Philippines)
	Republic Act No. 6969 (Toxic Substances and Hazardous and Nuclear Waste Control Act of 1990)
	Republic Act No. 8749 (Philippine Clean Air Act of 1999)
	Republic Act No. 9275 (Philippine Clean Water Act of 2004)
	Technical Bulletin No. 14 (Guidelines on Tree Cutting, Trimming and Pruning Within Areas Covered by 69 kV to 500 kV Transmission Line Facilities/Projects)
DEPARTMENT OF LABOR AND EMPLOYMENT	Department Order No. 13, s. 1998 (Guidelines Governing Occupational Safety and Health in the Construction Industry)
	Department Order No. 186-17 (Revised Rules for the Issuance of Employment Permits to Foreign Nationals)
	Department Order No. 198-18 (IRR of RA 11058)
	DOLE, DOJ, BI, and BIR Joint Guidelines No. 01-19 (Joint Guidelines on the Issuance of Work and Employment Permits to Foreign Nationals)
	Occupational Safety and Health Standards
	Presidential Decree No. 442 (Labor Code of the Philippines)
	Republic Act No. 11058 (An Act Strengthening Compliance with Occupational Safety and Health Standards and Providing Penalties for Violations Thereof)
	Republic Act No. 4566 (Contractors' License Law)
	Republic Act No. 7920 (New Electrical Engineering Law)
LOCAL GOVERNMENT UNIT	Local Tax Code of the City/Municipality
	Local Zoning Ordinance of the City/Municipality
	Presidential Decree 1096, s. 1977 (National Building Code of the Philippines)
	Presidential Decree 856, s. 1975 (Sanitation Code of the Philippines)
	Republic Act No. 7160 (Local Government Code of 1991)
MARITIME INDUSTRY AUTHORITY	MARINA Advisory No. 2017-12 (Deferment of Implementation of MARINA Circular No. 2016-01 on the Revised Rules on the Mandatory Passenger Insurance Coverage; Emergency Assistance to Survivors of Maritime Accidents/Incidents; and Other Relevant Concerns)
	MARINA Advisory No. 2018-02 (Proper Filling-up of Entries on the Seafarer's Identification and Record Book)

Table 3. Policies that guide the development and importation of LNG

AGENCY	GUIDING POLICY/REGULATION/LAW
MARITIME INDUSTRY AUTHORITY	MARINA Circular No. 104 (Omnibus Guidelines for the Acquisition of Vessels for Domestic Operations and Fishing Vessel/Boat)
	MARINA Circular No. 105 (Guidelines on the Temporary Utilization of Foreign-Owned/Registered Vessels and Philippine-Registered Overseas Vessels in the Domestic Trade)
	MARINA Circular No. 2013-02 (Revised Rules for the Registration, Documentation and Deletion of Ships Operating in Philippine Waters)
	MARINA Circular No. 105A (Amending Memorandum Circular No. 105 on the Guidelines on the Temporary Utilization of Foreign-Owned/Registered Vessels and Philippine-Registered Overseas Vessels in the Domestic Trade)
	MARINA Circular No. 121 (Policy Guidelines in the Regulation of High Speed Craft)
	MARINA Circular No. 186 (Rules on the Accreditation of Maritime Enterprises)
	MARINA Circular No. 2006-03 (Revised Guidelines on the Accreditation of Domestic Shipping Enterprises or Entities)
	MARINA Circular No. 2009-02 (Amending Section 1 of Rule V of the IRR of 9295 on Foreign Ships Engaged in Trade and Commerce in Philippine Territorial Waters)
	MARINA Circular No. 2010-01 (Revised Policy Guidelines on Tankers)
	MARINA Circular No. 2011-04 (Revised Rules on the Temporary Utilization of Foreign-Registered Ships Within the National Territory)
	MARINA Circular No. 2017-02 (Rules on the Temporary Utilization of Foreign-Registered Highly Specialized Ships within Philippine Territorial Waters)
	MARINA Circular No. 2017-04 (Rules on the Importation of Passenger Ships)
NATIONAL COMMISSION ON INDIGENOUS PEOPLES	MARINA Circular No. 90 (Implementing Guidelines for Vessel Registration and Documentation)
	Republic Act No. 9295 (Domestic Shipping Development Act of 2004)
NATIONAL WATER RESOURCES BOARD	NCIP Administrative Order No. 3, s. 2012 (Revised Guidelines on Free and Prior Informed Consent (FPIC) and Related Processes of 2012)
	Republic Act No. 8371 (Indigenous Peoples' Rights Act of 1997)
NATIONAL WATER RESOURCES BOARD	Presidential Decree No. 1067 (Water Code of the Philippines and its Amended IRR)

Table 3. Policies that guide the development and importation of LNG

AGENCY	GUIDING POLICY/REGULATION/LAW
PHILIPPINE COAST GUARD	MARPOL 73/78 (International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978)
	Memorandum Circular 07-14 (Prevention of Pollution from Garbage)
	Memorandum Circular No. 04-05 (Accreditation of Oil Water Separators, Oil Containment, Recovery and Dispersal Equipment and Chemical Dispersant)
	Memorandum Circular No. 06-05 (Issuance of International Oil Pollution Prevention Certificate to Philippine Registered Vessels)
	Memorandum Circular 07-96 (Operation and Maintenance of Aids to Navigation)
	Memorandum Circular No. 08-14 (Rules and Regulations for Tank Cleaning and the Collection and Disposal of Diluted Oil and other Substances)
	Memorandum Circular No. 01-05 (Rules and Regulations Prescribing the Establishment, Administration, Operation, and Maintenance of Private Aids to Navigation)
	Memorandum Circular No. 09-14 (Shipboard Oil Pollution Emergency Plan for Philippine Registered Vessels)
	Memorandum Circular No. 10-14 (Prevention of Pollution from Sewage)
PHILIPPINE PORTS AUTHORITY	PPA Administrative Order No. 006-1995 (Liberalized Regulations on Private Ports Construction, Development and Operation)
	Presidential Decree No. 857 (Revised Charter of the Philippine Ports Authority)
PHILIPPINE RECLAMATION AUTHORITY	PRA Administrative Order No. 2007-2 (IRR of EO 543 Delegating to the Philippine Reclamation Authority the Power to Approve Reclamation Projects)



3

INCENTIVES AND POLICIES THAT FACILITATE INVESTMENTS

Businesses aiming to set up and operationalize LNG facilities can take advantage of the policies that facilitate investments and provide incentives to investors. These are indicated below.

Streamlined Regulatory Procedures for Energy Projects

Executive Order No. 30: Creating the Energy Investment Coordinating Council (EICC) was enacted to ensure an efficient and effective administrative process projects endorsed by the DOE as “projects of national significance”. Energy Projects of National Significance (EPNS) possess any of the following attributes:

- a. Significant capital investment of at least Php 3.5 billion;
- b. Significant contribution to the country's economic development;
- c. Significant consequential economic impact;
- d. Significant potential contribution to the country's balance of payments;
- e. Significant impact on the environment;
- f. Complex technical processes and engineering designs; and/or
- g. Significant infrastructure requirements

The EO created the EICC composed of different government agencies to streamline the regulatory processes, requirements, and forms relevant to the energy projects. Specifically, the EICC are tasked to:

- a. Establish a simplified approval process and harmonize relevant rules and regulations of all government agencies involved in obtaining permits and regulatory approvals;
- b. Prepare rules governing the resolution of inter-agency issues affecting the timely and efficient implementation of EPNS and other energy projects;
- c. Maintain a database and a web-based monitoring system which shall serve as a platform for information exchange and updates on the applications of EPNS and other energy projects;
- d. Create inter-agency subcommittees as may be necessary to fulfill its mandate;
- e. Submit a quarterly progress report to the Office of the President; and
- f. Perform other necessary or supplementary functions to attain the objectives of the EO

Presumption of Prior Approvals. The EICC and all government agencies in charge of issuing permit applications for EPNS shall act on the presumption that relevant permits from other agencies had already been complied with by the project. Government agencies shall process the permit applications without awaiting the action of any other agency.

Processing of Applications. The EICC and all government agencies shall inform the applicants in writing whether applications are approved or

rejected within thirty (30) days after receiving the complete documentary requirements. In case no decision was made within 30 days, the approving authority may no longer deny the application and shall issue the relevant permit within five (5) working days after the thirty-day timeframe. In addition, the EICC may call for assistance from any agency and local government in performing its functions with respect to the processing of permits of EPNS.

Fiscal and Non-Fiscal Incentives

Omnibus Investments Code

The Omnibus Investments Code (OIC) of 1987 provides fiscal and non-fiscal incentives to domestic and foreign investors on preferred activities of investment as listed in the 2017 Investment Priorities Plan (IPP) of the Bureau of Investments (BOI). Under infrastructure and logistics, LNG storage and regasification facilities and pipeline projects for oil and gas are included in the list of preferred activities. In addition, power generation projects using natural gas are also included under the area of energy.¹⁴

Once registered with the BOI under the OIC, investors may avail of the following relevant incentives¹⁵:

- a. Income tax holiday.** Exemption from income tax for six (6) years for pioneer firms and four (4) years for non-pioneer firms from the start of commercial operations. This income tax holiday can be extended and may be availed up to a maximum of eight (8) years subject to the criteria on capital equipment to

labor ratio¹⁶, net foreign exchange earnings¹⁷, and indigenous raw material cost¹⁸ set by the BOI. Expanding firms are also entitled to an income tax exemption proportionate to their expansion for a period of three (3) years from commercial operation; however, expanding firms are not entitled to additional deduction for incremental labor expense.

b. Additional deduction for labor expense.

Registered enterprises are allowed an additional deduction from the taxable income of fifty percent (50%) of the wages corresponding to the increment in the number of direct labor for skilled and unskilled workers subject to the capital equipment to labor ratio criterion. This deduction may be doubled if the activity is located in less developed areas as defined in the OIC.

c. Tax and duty exemption on imported capital equipment and its accompanying spare parts.

New and expanding registered enterprises are exempt up to one hundred percent (100%) of the customs duties and national internal revenue tax for importations of machinery, equipment, and spare parts given that equipment are (i) not sufficiently produced domestically, not of comparable quality, or not reasonably-priced (ii) deemed necessary by the BOI and will be used exclusively by the registered enterprise, and (iii) approved by the BOI.

¹⁴ See Board of Investments Memorandum Circular No. 2017-004.

¹⁵ See Omnibus Investment Code (Executive Order No. 226).

¹⁶ Capital equipment to labor ratio criterion: $(\text{Derived US\$ cost of capital equipment} / \text{Average number of direct labor}) \leq \text{US\$ } 28,000.00$

¹⁷ Net foreign exchange earnings/savings criterion: export sales/local sales of import substitutes or the derived average foreign exchange earnings/savings less foreign exchange costs/expenses for the first three (3) years of commercial operation should be at least US\$ 500,000

¹⁸ Indigenous raw material cost criterion: $(\text{Cost of indigenous raw materials} / \text{Total cost of raw materials}) \times 100\% \geq 50\%$

d. Tax credit on domestic capital equipment.

Registered enterprises are given one hundred percent (100%) tax credit equivalent to the value of the taxes and duties from the importation of the equipment that would have been waived given that the said equipment are (i) reasonably needed and will be used exclusively by the registered enterprise in the manufacturing of its product, (ii) qualified for tax and duty-free importation, (iii) approved by the BOI, and (iv) purchased within five (5) years from the date of effectivity of the OIC.

e. Exemption from contractor's tax.

Registered enterprises are exempt from paying the contractor's tax, whether national or local.

f. Simplification of customs procedures.

The BOC shall subject registered enterprises to a simplified procedure for the importation of equipment, spare parts, raw materials and supplies, and exports of processed products.

g. Unrestricted use of consigned equipment.

Machinery, equipment, and spare parts consigned to any registered enterprise are not subject to period of use restrictions provided that they satisfy other relevant rules in this Code.

h. Employment of foreign nationals.

Foreign nationals may be employed in supervisory, technical, or advisory positions for a maximum of five (5) years that may be extended at the discretion of the BOI

provided that they complied with the rules set forth by Section 29 of the Commonwealth Act No. 613 (as amended).¹⁹ The spouse and unmarried children below twenty-one (21) years of age are also permitted to enter and reside in the Philippines during the period of employment of the foreign national. In addition, if an enterprise is majorly owned by foreign investors, the positions of president, treasurers, and general manager or their equivalents may be retained by foreign nationals beyond the 5-year period.

i. Tax credit raw materials.

Registered enterprises are given a tax credit equivalent to the taxes and duties paid on the supplies, raw materials, and semi-manufactured products used in the manufacture, processing, or production of its export products and forming parts.

Import Duty Exemption

Republic Act No. 1937 also known as the Tariff and Customs Code of the Philippines (TCCP)²⁰ governs the tariff implementation of the country. The TCCP (Section 104 in particular) also provides the tariff schedule and duties imposed on goods and articles entering the country.

Tariff rates are generally levied in ad valorem form and depend on existing regional and bilateral trade agreements. Currently, duty rates are classified in either one of the two (2) most widely implemented tariff schedules as per the TCCP - the (1) Most Favored Nation (MFN) and (2) ASEAN Trade in Goods Agreement (ATIGA). Under the MFN, rate ranges from zero to thirty percent (0-30%). On

¹⁹ See Philippine Immigration Act of 1940 (Commonwealth Act No. 613)

²⁰ See 2017 ASEAN Harmonized Tariff Nomenclature (AHTN).

the other hand, under the ATIGA, ASEAN member states including the Philippines, agreed to impose an import duty of zero percent (0%) on ninety-nine percent (99%) of all products listed in their Inclusion List (IL).²¹

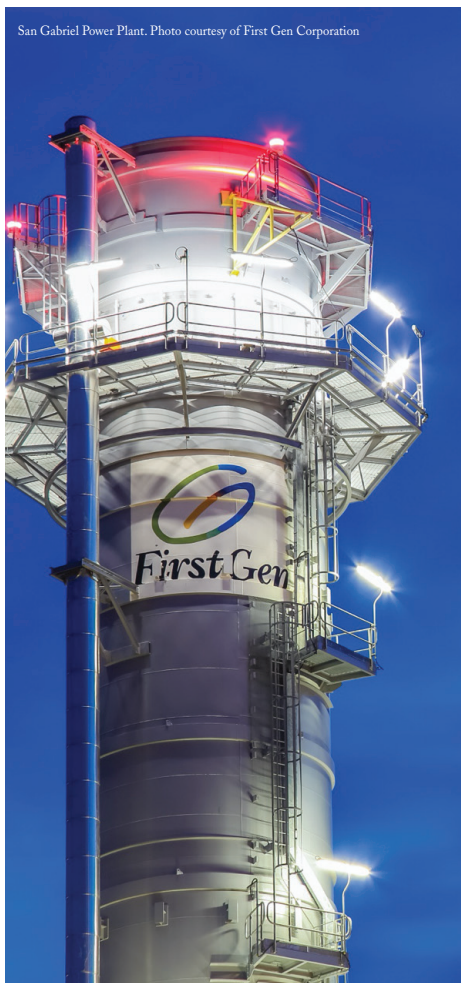
In addition to the rate schedule, the Philippines is implementing the 2017 ASEAN Harmonized Tariff Nomenclature (AHTN) in naming and classifying imported goods. This classification system is also followed by other ASEAN member states - Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Singapore, Thailand, and Vietnam - to facilitate smoother trade flow in the region.

Section V, Chapter 27.11 of the 2017 AHTN focuses on natural gas and classifies it in liquid and gaseous states as one of the import/export products given a zero percent (0%) rate of duty both under the MFN and ATIGA. This free import duty is granted to all ASEAN member states.

Excise Tax Exemption

The Tax Reform for Acceleration and Inclusion (TRAIN) Act exempts locally-extracted or indigenous natural gas in liquid and gas forms from any excise tax.²² This Act amended Republic Act No. 8424 or the National Internal Revenue Code (NIRC) which previously imposed an excise tax rate of two percent (2%) on locally-extracted natural gas (gas and liquid). This excise tax exemption also came after the restructuring of excise tax levied on petroleum products as provided in Bureau of Internal Revenue (BIR) Regulation No. 8-96 or the "Act Restructuring the Excise Tax on Petroleum Products, Reclassifying Natural Gas and Liquefied

Natural Gas under Non-Metallic Mineral and Quarry Resources and Reducing the Excise Tax on Indigenous Petroleum." The same regulation imposes a 4-percent excise tax on imported LNG based on the Bureau of Customs (BOC) valuation.



San Gabriel Power Plant. Photo courtesy of First Gen Corporation

²¹ See Chapter VII on tariff and customs duties of National Tax Research Center (NTRC) 2016 Guide to Philippine taxes.

²² See Bureau of Internal Revenue (BIR) Index for excise tax.

San Gabriel Power Plant. Photo courtesy of First Gen Corporation



4

PRIMER FOR APPLICATION



Malampaya natural gas platform. Photo courtesy of Shell Philippines Exploration

This portion provides a quick guide for applicants, including documentary requirements and forms for the application of various permits to set up and operate liquified natural gas facilities based on Department of Energy (DOE) Department Circular (DC) No. 2017-11-0012 as well as subsequent department orders and laws. The permits are issued for an entire facility and not based on the individual parts. The permits are being applied for individually. Permits for construction, expansion, rehabilitation or modification are applied for separately.

The Circular initially identified 45 days for the review of application. This was superseded by Republic Act

(RA) No. 11032 signed and was approved on the 28th of May 2018 which shortened the number of days. This is reflected in the succeeding parts below.

The Primer contains information on the process and requirements for the application of the following:

1. Notice to Process (NTP)
2. Permit to Construct, Expand, Rehabilitate, and Modify (PCERM)²³
3. Permit to Operate and Maintain (POM))

²³ Permits to be applied for are dependent on the project phase (e.g. Permit to Construct; Permit to Expand; Permit to Rehabilitate; Permit to Modify)

Overall Process of Permit Application

Figure 9 below indicates the overall process of application of permits from setting up to operationalization of LNG facilities.

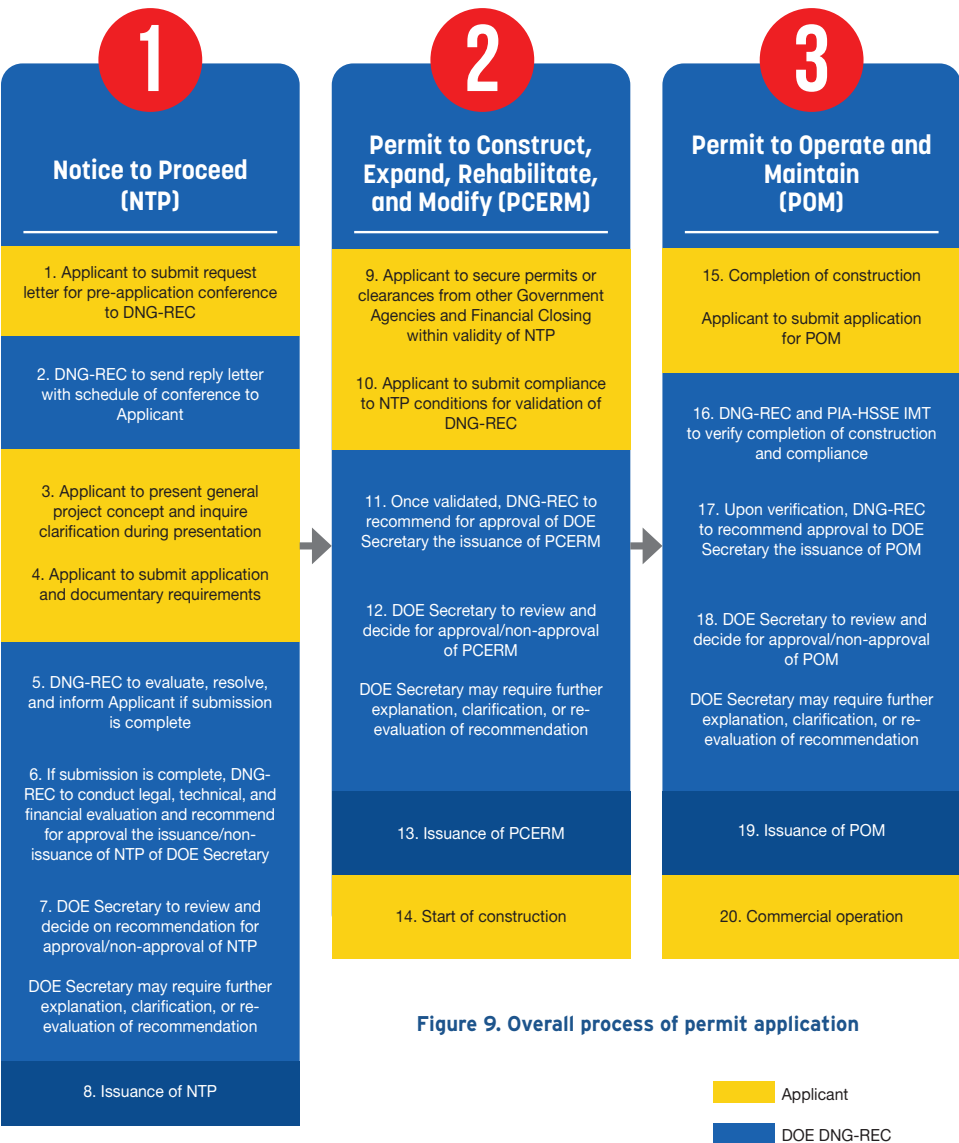
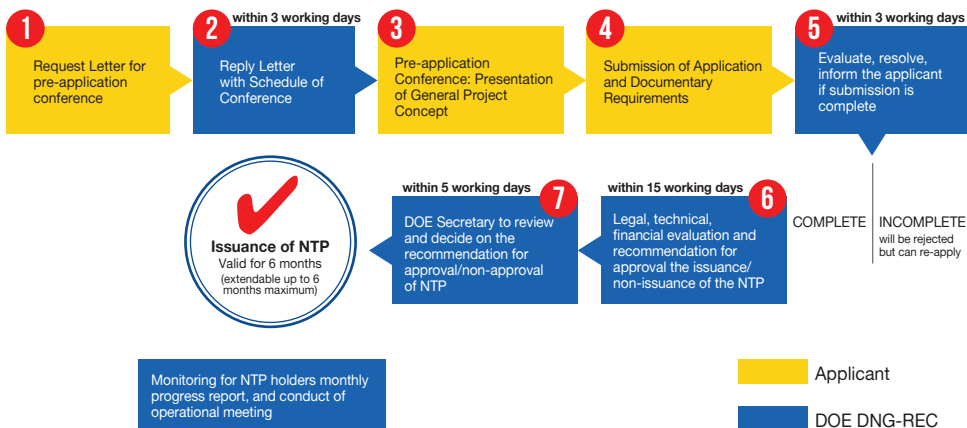


Figure 9. Overall process of permit application

Notice to Proceed (NTP)

Figure 10 below outlines the process for the application of NTP. The NTP is valid for six (6) months, and may be extended once for another six (6) months. The issuance of NTP authorizes the applicant to secure permits from other agencies. The number of days are indicated below.

Figure 10. NTP application process and requirements



Required Documentation

LEGAL	TECHNICAL	FINANCIAL
1. Information Sheet 2. SEC Registration 3. Certified true copy of the General Information Sheet (GIS) 4. Secretary's certificate	1. Applicant profile 2. Construction plans and design 3. Health, safety, environment (HSSE) Assessment and Management Plan (Construction and Equipment Installation Phase)	1. Economic/Financial Feasibility Report 2. Financial Closing Methodology 3. Supporting Documents <ul style="list-style-type: none"> • Certified executed copies of key binding agreements (e.g.EPG agreements, LNG supply agreement, Gas sales agreement) • Certified true copy of Applicant's tax clearance certificate • Specific requirements for corporations existing > 2 years • Specific requirements for newly-organized corporation existing < 2 year • Requirements for earmarked fund guarantee from chosen member/s of Applicant Group (for applicants with insufficient ability to raise equity share)

Application Process for NTP

1. The Applicant shall submit a letter of request for a pre-application conference addressed to the DNG-REC Chair.
2. The DNG-REC shall, within three (3) working days from receipt of the letter request, send a reply-letter to the Applicant stating the schedule of the pre-application conference.
3. During the pre-application conference, the Applicant shall present the general project concept to the DNG-REC including the discussions on any clarification of the rules and requirements of the permit application.
4. The Applicant shall submit the application with all the documentary requirements, including the payment of processing fee, addressed to the DNG-REC Chair.
5. The DNG-REC shall, within three (3)²⁴ working days from receipt of the application, evaluate, resolve and inform the Applicant whether or not it has submitted completely all the documentary requirements. A complete application shall qualify for further substantive legal, technical and financial evaluation while incomplete submission shall be automatically rejected without prejudice to the right of the Applicant to re-apply.
6. The DNG-REC shall conduct, within fifteen (15) working days, the substantive legal, technical and financial evaluation and recommend, for approval of the DOE Secretary, the issuance or non-issuance of the NTP.

7. The DOE Secretary shall, within five (5) working days from date of receipt of the recommendation from the DNG-REC, review and decide on the recommendation for approval or non-approval of the NTP.

The DOE Secretary may, within an appropriate additional period given to the DNG-REC, require further explanation, clarification or re-evaluation of the recommendation.

Requirements for the Issuance of NTP

A. Legal Documentation

1. Duly filled-out covering information sheet showing a brief profile of the Applicant (see Annex 2);
2. Certified true copies of the Securities and Exchange Commission (SEC), Certificate of Registration, Articles of Incorporation and By laws, and latest Certificate of Amendment, if applicable; or their foreign equivalents. The corporate purpose of the Applicant shall include the authority to construct and operate Downstream Natural Gas Facilities;
3. Certified true copy of the updated General Information Sheet (GIS), or their foreign equivalent, and stamped-received by the Securities and Exchange Commission (SEC) within twelve (12) months from date of the filing of application; and
4. Original Copy of the Secretary's Certificate showing authority of the Applicant's representative to apply, negotiate, sign and execute documents in relation to the application.

²⁴ DC 2017-11-0012 initially identified 45 days for the review of application. This was superseded by RA No. 11032 signed and approved on 28 May 2018 which mandates agencies to process "...applications or requests involving activities which pose danger to public health, public safety, public morals, public policy, and highly technical application, the prescribed processing time shall in no case be longer than twenty (20) working days or as determined by the government agency or instrumentality concerned, whichever is shorter...."

B. Technical Documentation

1. Applicant Profile

A duly notarized description of its own, or if necessary, including that of the chosen member/s of the Applicant Group, experience and technical capability relevant to carrying out the proposed Project (see **Annex 3**).

2. Construction Plans and Designs

- a. General Project Description;
- b. Locational zoning clearance subject to the local government zoning ordinance;
- c. Quantitative risk assessment report for safe distance requirements;
- d. Environmental (land, air, water and people) impact identification, prevention and mitigation assessment report of the proposed infrastructure and processes on the proposed site consistent with the Philippine Environmental Impact Statement System (EISS) Law and its implementing rules;
- e. Geologic, Oceanographic, Seismic, Atmospheric, and Security hazard identification, prevention and mitigation assessment report;
- f. Distribution Impact Study (DIS) and Distribution Asset Study (DAS) or embedded power plant construction plan for power supply requirement;
- g. Front End Engineering Design (FEED) and detailed building and equipment plans and designs (as developed during FEED and together with evidence of completion of the FEED stage) and their corresponding work program and budget.
 - g.1. Conceptual plans and designs of buildings, other facilities and equipment, with descriptions and flow diagram of their construction and installation processes including the integrity and safety engineering methods and technology applied with due consideration of the

results of the assessments made from items guideline 2.a to 2.f above;

- g.2. Summary list with sufficient description of the Philippine or Internationally accepted codes and standards specifically used as basis on the formulation of the plans and designs for the construction of buildings and other facilities and the installation of equipment including the materials used therein;
- g.3. Planned Construction Schedule;
- g.4. Plot Plans and list of key buildings, other facilities, equipment, access roads, safety zones and distances;
- g.5. Manpower and construction equipment requirements;
- g.6. Management of change system;
- g.7. Maintenance of records system.
- h. Third party quality assurance program validation:
 - h.1. Safety and Quality Assurance Certifications of the plans and designs of the buildings, other facilities and installed equipment;
 - h.2. Safety and Quality Assurance Certifications of the material used on the construction, facilities and equipment; and
 - h.3. Safety and Quality Assurance Certifications of the applied engineering and technology for the construction, installation and operation of the buildings, facilities and equipment.
- i. A summary of the execution plan for the establishment of a professional project management team for construction, installation, testing and commissioning;
- j. A summary report prepared by the Applicant on other Government agencies' permitting requirements before construction and before operation; and
- k. Other relevant studies or assessment reports that the Applicant may deem necessary to support its application.

C. Health, Safety, Security and Environment (HSSE) Assessment and Management Plan (Construction and Equipment Installation Phase)

Submission of HSSE Management Systems, management and employee structure, manpower complement, qualification and competency/ training development program and mitigation plans to address the risks at ALARP levels in the following areas:

a. Environmental Risk Assessment and Management Plan

Consistent with the Philippine environmental regulations and/or International Standard, a comprehensive assessment and management program shall be established to address project-specific risks and potential impacts to the environment.

Potential environmental issues associated with the construction and installation of LNG equipment which includes, but are not limited to the following:

1. Threats to aquatic and shoreline environments;
2. Hazardous material management;
3. Wastewater;
4. Air emissions;
5. Waste management; and
6. Noise.

b. Occupational Health and Safety Risk Assessment and Management Plan

Occupational health and safety issues shall be part of a comprehensive hazard identification, risk assessment and management study which include but is not limited to Hazard Identification study (HAZID), Hazard and Operability study (HAZOP), and qualitative and quantitative risk assessments shall be conducted as appropriate. The results of these studies shall be used as input to the Health and Safety Plans (HASP) specific to construction and equipment installation phases. The HASP

shall include but is not limited to environmental and safety processes, and safe systems of work/ procedures which shall be prepared, communicated and implemented to manage the risks.

Occupational health and safety issues associated with the construction and installation of Downstream Natural Gas Facilities which includes, but are not limited to, the following:

1. Fire and explosion;
2. Roll-over;
3. Contact with cold surfaces;
4. Chemical hazards;
5. Confined spaces;
6. Working at heights;
7. Lifting and rigging;
8. Excavation; and
9. Other construction and installation related hazards.

c. Facility Security Risk Assessment and Management Plan

Facility security assessment shall be conducted to identify threats which include but is not limited to criminal and terrorist. The vulnerability of the facility/ location against identified threats shall likewise be assessed and corresponding plans shall be put in place.

d. Disaster/ Emergency Preparedness and Response Plan

Based on the HSSE assessment, a plan shall be put in place to prevent, mitigate, respond to, and maintain continuity from an incident that threatens life, property, operations and the environment. Incident as defined is anything that has the potential to cause interruption, disruption, loss, emergency, crisis, disaster or catastrophe; and

e. Other areas of concern that the Operator may deem necessary

D. Financial Documentation

The Applicant shall submit the following financial reports for each application:

1. Economic/Financial Feasibility report with clear demonstration of the projected revenue versus the costs associated with the project; and
2. Financial Closing methodology report covering the entire proposed work program and budget with clear demonstration of ability to meet funding requirements.

Required Documents:

1. Certified executed copies, which may be redacted for confidentiality reasons, of all key binding agreements required for the development of the proposed Project:

- a. Engineering, Procurement and Construction (EPC) agreement/s;
- b. LNG supply agreement/s of Operators and/or terminal user/s; and
- c. Gas sales agreement/s by Operator and/or terminal user/s with power or non-power customers.

2. Certified true copy of Applicant's tax clearance certificate from its respective tax regulating Government Agency for the immediate preceding year from year of application as required by the Philippine Executive Order No. 398;

3. For corporations existing for more than two (2) years at the time of filing of application:

- a. Certified true copy of the Annual Report or Audited Financial Statements (FS) for the last two (2) years from the date of the Application and Original copy of the latest Unaudited FS duly signed by the responsible official such as the President and/or Chief Finance Officer;
- b. Original copy of the Projected Cash Flow Statement covering the cash availability for

the entire construction and expansion or modification, if applicable;

c. Proof of ability to raise its equity share earmarked for the proposed Project as described in the Financial Closing methodology through any or a combination of the following:

- i. Original copy of the bank certification to substantiate the cash balance as of 10 business days prior to the date of application; and
- ii. Existing and readily available credit lines.

4. For newly-organized corporations existing for less than two (2) years at the time of filing of application:

- a. Certified true copy of the Audited Financial Statements (FS) or Original copy of the latest Unaudited FS duly signed by the responsible official such as the President and/or Chief Finance Officer;
- b. Original copy of the Projected Cash Flow Statement covering the cash availability for the entire construction and expansion or modification, if applicable; and
- c. Proof of ability to raise its equity share for the project through any or a combination of the following:
 - i. Original copy of the bank certification to substantiate the cash balance as of 10 business days prior to the date of application; and
 - ii. Existing and readily available credit lines

5. Applicant with insufficient ability to raise its equity share for the proposed Project may seek earmarked fund guarantee from the chosen member/s of the Applicant Group but shall be limited to its corresponding participating interest and shall thereby submit the following:

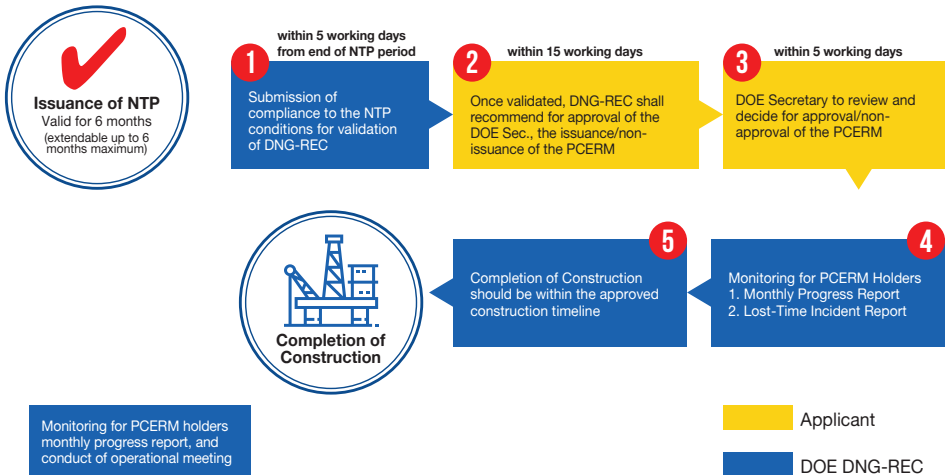
- a. Certified true copy of the shareholders or Parent Company's financial documents per

- 3.a to 3.c and 4.a to 4.c, as applicable; and
- b. Secretary's certificate confirming a board resolution authorizing the contribution to the funding of the equity share corresponding to its participating interest.

Permit to Construct, Expand, Rehabilitate, and Modify (PCERM)

The issuance of PCERM signals the construction of the proposed project. (see **Figure 11** below).

Figure 11. PCERM application process and procedures



Required Documentation

PERMITS	FINANCIAL
1. DENR - Applicable regulatory permits and requirements to satisfy the Environmental Compliance Certificate 2. LGU - Endorsement and Permits for Operation 3. NCIP - Certificate of Pre-Condition (if applicable) 4. DOLE - Registration and Permit to Operate 5. BIR, Philhealth, HDMF-Pag-ibig, and SSS registrations 6. Fire Safety Inspection Certificate (Fire Code) 7. Sanitary Permits (Sanitary Code) 8. Other permits as may be required by law and rules	1. Submission of Proof of Financial Closing

Application Process for PCERM

1. Upon approval and issuance of the NTP, the Applicant shall be given an NTP period of six (6) months from date of issuance of NTP, extendable for up to a maximum of six (6) months upon approval of the DNG-REC, unless extended again due to Force Majeure, to secure permits or clearances from the other Government Agencies and Financial Closing (NTP Conditions). The list of clearances, permits and issuing government agencies are indicated in the **Annex 4a** of this document.²⁵ The list is not exhaustive and may change as new policies are developed/promulgated. Other agencies/offices may also require permits as projects are developed in their jurisdiction.

To provide guidance to investors, the contact details of the offices issuing permits, licenses and clearances are indicated in **Annex 4b**.

2. Within five (5) working days from the end of the NTP period, the Applicant shall submit, for validation of the DNG-REC, its compliance to the NTP Conditions;

3. Upon validation of the fulfillment of the NTP Conditions and within fifteen (15) working days, the DNG-REC shall then recommend, for approval of the DOE Secretary, the issuance of the PCERM as an authority of the Operator to proceed with the construction or expansion, rehabilitation or modification, whenever applicable, of the Natural Gas Facilities;

4. The DOE Secretary shall, within five (5) working days from date of receipt of the recommendation from the DNG-REC, review and decide on the recommendation for approval or non- approval of the PCERM.

5. The DOE Secretary may, within an appropriate additional period given to the DNG-REC, require further explanation, clarification or re-evaluation of the recommendation;

6. To monitor the progress of the project, the Operator is required to submit regular progress report (see Annex 5), to the DNG-REC and, in coordination with the PIA HSSE-IMT, shall conduct on- site progress validation. The completion of construction shall be within the approved construction timeline;

Requirements for the Issuance of PCERM

The Operator shall proceed with the acquisition of permitting requirements of other Government Agencies for the construction, expansion, rehabilitation or modification, based on the summary report prepared by the Applicant on other Government agencies' permitting requirements which shall include the following:

A. Permits

1. Applicable regulatory permits from the Department of Environment and Natural Resources (DENR) and other requirements to satisfy the Environmental Compliance Certificate (ECC) provisions from the DENR;

2. Endorsement and Permits for Operation from the Local Government Unit (LGU);

3. Certificate of Pre-Condition (CP) from the National Commission on Indigenous Peoples (NCIP), if applicable;

4. Registration and Permit to Operate from the Department of Labor and Employment (DOLE);

²⁵ The list does not include other agencies that concern land-based LNG-carrying vehicles that may be pipelines or virtual pipelines.

5. Registration with the Bureau of Internal Revenue (BIR), Philippine Health Insurance Corporation (PhilHealth), HDMF-Pag-ibig and Social Security System Corporation (SSS);

6. Safety Inspection Certificate (Fire Code);

7. Sanitary Permit (Sanitary Code); and

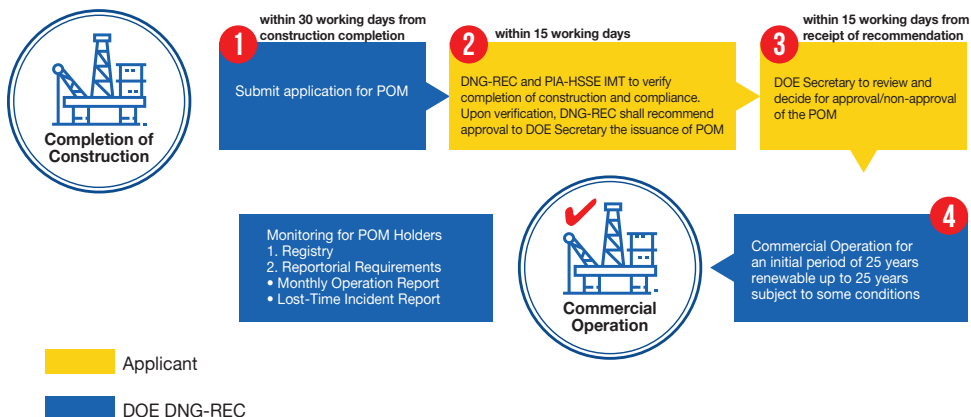
8. Other permits as maybe required by law or rules

B. Submission of Proof of Financial Closing

Permit to Operate and Maintain (POM)

Within 30 days of the completion of construction, the LNG investor will need to apply for a POM following the process included in **Figure 12** below.

Figure 12. POM application process and procedures



Required Documentation

PERMITS

1. Certificate of Completion
2. Summary List of Buildings, Facilities, and Equipment
3. Operational Process with Flow Diagram
4. Health, Safety, Security and Environment (HSSE) Assessment and Management Plan (Operational Phase)
5. Permitting Requirement of Other Government Agencies for the Operation of the Facility

Application Process for POM

1. Within thirty (30) working days from the practical completion of the construction, the Operator shall submit an application for POM attaching the Requirements for the issuance of POM;

2. The DNG-REC, in coordination with the PIA-HSSE IMT, shall verify the completion of construction and compliance to the testing and commissioning requirements under the EPC contract and that the Natural Gas Facility otherwise complies with applicable regulation. Upon verification, the DNG-REC shall recommend, for approval of the Secretary, the issuance of POM; and

3. The DOE Secretary shall, within fifteen (15) working days from date of receipt of the recommendation from the DNG-REC, review and decide on the recommendation for approval or non-approval of the POM.

4. The DOE Secretary may, within an appropriate additional period given to the DNG-REC, require further explanation, clarification or re-evaluation of the recommendation; and

5. By the authority of POM, the Operator shall proceed to the commercial operation of the Downstream Natural Gas Facilities for an initial period of twenty (25) years renewable for up to a maximum of twenty-five (25) years subject to the following conditions:

- i. That the Operator and the Natural Gas Facilities continue to be legally, technically and financially competent to operate for the renewal period; and
- ii. That the Operator shall submit the renewal application at least six (6) months before the expiration of the POM.

Requirements for the Issuance of POM

After completion of construction, the Operator shall proceed to the application of POM. The Operator shall submit an application for a POM to the DOE within thirty (30) working days from the completion of construction which shall include the following documents:

1. Certificate of Completion;

Refers to the certificate of practical completion and certificate of completion testing issued by the Engineering, Procurement and Construction (EPC) Contractor with the conformity of the Owner's project manager;

2. Summary List of Buildings, Facilities and Equipment;

3. Operational Process with Flow Diagram;

Description of operational process with flow diagram of building, facilities, and equipment for testing, commissioning, operation, repair and maintenance for DOE guidance and reference;

4. Health, Safety, Security and Environment (HSSE) Assessment and Management Plan (Operational Phase)

Submission of HSSE management systems, management and employee structure, manpower complement, qualification and competency/training development program and mitigation plans to address the risks at ALARP levels in the following areas:

5. Environmental Risk Assessment and Management Plan

Consistent with the Philippine environmental regulations and/or International Standard, a comprehensive assessment and management program shall be established to address project-specific risks and potential impacts to the environment.

Potential environmental issues associated with the construction and installations of LING equipment include but are not limited to the following:

- a. Threats to aquatic and shoreline environments;
- b. Hazardous material management;
- c. Wastewater;
- d. Air emissions;
- e. Waste management; and
- f. Noise.

6. Occupational Health and Safety Risk Assessment and Management Plan

Occupational health and safety issues shall be part of a comprehensive hazard identification, risk assessment and management study which include but is not limited to Hazard Identification study (HAZID), Hazard and Operability study (HAZOP), and qualitative and quantitative risk assessments shall be conducted as appropriate. The results of these studies shall be used as input to the Health and Safety Plans (HASP) specific to construction and equipment installation phases. The HASP shall include but is not limited to environmental and safety processes, and safe systems of work/ procedures which shall be prepared, communicated and implemented to manage the risks.

Occupational health and safety issues associated with the construction and installation of Downstream Natural Gas Facilities include but are not limited to the following:

- a. Fire and explosion;
- b. Roll-over;
- c. Contact with cold surfaces;
- d. Chemical hazards;
- e. Confined spaces;
- f. Working at heights;
- g. Lifting and rigging;
- h. Excavation; and
- i. Other construction and installation related hazards.

7. Facility Security Risk Assessment and Management Plan

Facility security assessment shall be conducted to identify threats which include but is not limited to criminal and terrorist. The vulnerability of the facility/ location against identified threats shall likewise be assessed and corresponding plans shall be put in place.

8. Disaster/Emergency Preparedness and Response Plan

Based on the HSSE assessment, a plan shall be put in place to prevent, mitigate, respond to, and maintain continuity from an incident that threatens life, property, operations and the environment which shall be developed in close coordination with the community, local government unit and other stakeholders of the location where they operate. Incident as defined is anything that has the potential to cause interruption, disruption, loss, emergency, crisis, disaster or catastrophe.

9. Community social development program

These programs are intended to improve the well-being of the community in the locality where the project is located on areas such as health, education, livelihood and other programs that promotes improvement of the lives and welfare of the community.

10. Other areas of concern that the Operator may deem necessary.

11. Permitting Requirement of Other Government Agencies for the Operation of the Facility which shall include the following:

- a. Applicable regulatory permits from the Department of Environment and Natural Resources (DENR) and other requirements to satisfy the Environmental Compliance Certificate (ECC) provisions from the DENR;

-
- b. Endorsement and Permits for Operation from the Local Government Unit (LGU);
 - c. Certificate of Pre-Condition (CP) from the National Commission on Indigenous Peoples (NCIP), if applicable;
 - d. Registration and Permit to Operate from the Department of Labor and Employment (DOLE);
 - e. Registration with the Bureau of Internal Revenue (BIR), Philippine Health Insurance Corporation (PhilHealth), HDMF-Pag-ibig and Social Security System Corporation (SSS);
 - f. Fire Safety Inspection Certificate (Fire Code);
 - g. Sanitary Permit (Sanitary Code); and
 - h. Other permits as maybe required by law or rules

ANNEX 1. DEPARTMENT ORDER NO. 2018-03-003



Republic of the Philippines
DEPARTMENT OF ENERGY

DEPARTMENT ORDER NO. DO2018-03-003

**CREATION OF A CENTRALIZED REVIEW AND EVALUATION COMMITTEE FOR
THE PURPOSE OF INTEGRATING THE CURRENT COMMITTEES ADMINISTERING
THE REVIEW AND EVALUATION OF RENEWABLE ENERGY, PETROLEUM,
DOWNSTREAM NATURAL GAS, AND COAL SERVICE CONTRACT
APPLICATIONS, THE AWARD, AMENDMENT AND TERMINATION OF
CONTRACTS**

WHEREAS, Republic Act No. 7638, as amended, otherwise known as "The Department of Energy (DOE) Act of 1992", mandates the Department of Energy (DOE) to prepare, integrate, coordinate, supervise and control all plans, programs, projects and activities of the Government relative to energy exploration, development, utilization, distribution, and conservation;

WHEREAS, on 7 April 2017, Department Order (DO) No. 2017-04-0005, otherwise known as "Prescribing the New Guidelines in the Processing of Applications for Renewable Energy Service/Operating Contracts" has been issued and adopted;

WHEREAS, on 18 December 2017, Special Order (SO) No. 2017-12-0068, otherwise known as "Designating the Members of the Department of Energy (DOE) Downstream Natural Gas Review and Evaluation Committee (DNG-REC) has been issued and adopted;

WHEREAS, on 17 January 2018, SO No. 2018-01-0009, otherwise known as "Designating the Members of the Department of Energy (DOE) Review and Evaluation Committee (REC)" has been issued and adopted;

NOW THEREFORE, in the exigency of service and in consideration of the above premises, to further implement the coordination of all bureaus concerned, for the necessary management relative to energy exploration, development, utilization, distribution and conservation, the following designation, duties and responsibilities are hereby adopted and promulgated for compliance by all concerned:

Section 1. Constitution of the Centralized Review and Evaluation Committee (C-REC). The CREC is hereby constituted as follows:

Chairman : Undersecretary Donato D. Marcos
Vice Chairman : Assistant Secretary Caron Aicitel E. Lascano

Members:
1. Assistant Secretary Redentor E. Delola
2. Assistant Secretary Leonido C. Pulido, III
3. Assistant Secretary Gerardo D. Erguiza, Jr.

Energy Center, Rizal Drive, Bonifacio Global City, Taguig City, Philippines
Telephone: 476-2900; Fax: 812-6194; www.doe.gov.ph



Republic of the Philippines
DEPARTMENT OF ENERGY

Section 2. C-REC Technical Working Group (TWG). The C-REC, in all of its proceedings shall be assisted by the C-REC-TWG to be composed of the following:

Head -	Director of the Bureaus concerned
Members-	Director Cesar G. dela Fuente III
	Division Chief or Assistant Division Chief of the
	Bureaus concerned,
	Director of the Financial Services (FS)
	Director of the Legal Services (LS)

Section 3. C-REC Secretariat. The C-REC and C-REC-TWG, in all of its regular and special meetings shall have an administrative support from a C-REC Secretariat which shall be composed of Ms. Lilian Fernandez as Head and Assistant Director of the Bureaus concerned as members.

The C-REC shall designate such number of staff as may be needed to assist the C-REC Secretariat in its administrative support functions;

Section 4. Separability Clause. If for any reason, any provision or section of this DO is declared unconstitutional, or invalid, such part not affected shall remain in full force and effect;

Section 5. Repealing Clause. All DOE issuances that are inconsistent with the provisions of this DO are hereby repealed or amended accordingly;

Section 6. Effectivity. This DO shall take effect immediately.

Issued this ____ day of March 2018 in Bonifacio Global City, Taguig City, Metro Manila.


Alfonso G. Cusi
Secretary



MAR 16 2018

ANNEXES

ANNEX 2. BRIEF PROFILE OF APPLICANT

Particulars	Operators	Parent Company	Joint Venture/ Consortium Members	Parent Company
1. Name and Participating Interest				
2. Address				
3. Country of Registration				
4. Name of Authorized Representative				
5. Position				
6. Telephone Number/s				
7. Fax Number/s				
8. Email Address				
9. Website Address				
10. Summary Description Of Application: <input type="checkbox"/> Construct <input type="checkbox"/> Expand <input type="checkbox"/> Rehabilitate <input type="checkbox"/> Modify <input type="checkbox"/> Operate and Maintain				

CERTIFICATION

I certify under penalty of law, based on information and belief formed after reasonable inquiry, the statements and information contained in these documents are true, accurate and complete.

Name and signature of authorized representative: _____
Date: _____

ANNEX 3. NTP APPLICANT PROFILE

1. A summary of the company profile, business direction, strategy and major accomplishments in the downstream Natural Gas industry;
2. A summary and description of all gas-related projects completed and pending, if any, for at least the past three (3) years preceding the date of the application including the assessment of the performance of their construction, operation and economic feasibilities;
3. Description of the qualifications and experience of key management, professional and technical personnel in the Downstream Natural Gas Facility construction and operation;
4. Disclosure of any pending or determined with finality major safety or environmental enforcement actions by relevant authorities;
5. Description of existing Natural Gas supply sustainability program and arrangements;
6. If Applicant Group's technical capability will be used, the Secretary's certificate of the chosen member/s confirming a board resolution authorizing the commitment of the identified technical capability to the proposed Project;
7. Other information that the Applicant may deem necessary to support its application or as maybe required by the DNG-REC.

ANNEXES

ANNEX 4A. LIST OF CLEARANCES, PERMITS AND ISSUING GOVERNMENT AGENCIES²⁶

REGISTRATION				
AGENCY	SPECIFIC OFFICE/ BUREAU IN- CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
Bangko Sentral ng Pilipinas		Registration of Foreign Investments for Purposes of Capital Repatriation and Profit Remittances		
Bureau of Immigration		Alien Certification of Registration		
		Philippine Special Work Permit		
		Philippine Visa		
		Special Investor's Resident Visa		
Bureau of Internal Revenue		Application for Authority to Use Computerized Accounting System or Components Thereof/Loose-Leaf Books of Accounts		
		Application for Registration Information Update		This is also where books of accounts and authority to print are registered
		Certificate of Registration	Annual	
		Tax Identification Number	Once	
Cooperative Development Authority		Registration for Cooperatives		
Department of Energy	Oil Industry Management Bureau	DOE Certificate of Endorsement to SEC	Once	This is for company registration with energy-related activities
		DOE Certificate of Endorsement to BOI		For project registration to avail incentives under EO 226
Department of Labor and Employment	Regional Office	Alien Employment Permit	Maximum of three (3) years	Applicable to foreign nationals
		Registration of Establishment	Once	This is applied per establishment

²⁶ Permits listed may or may not be applicable to applicant depending on the type of project being applied for.

REGISTRATION				
AGENCY	SPECIFIC OFFICE/ BUREAU IN- CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
Department of Trade and Industry		Registration of Business Name for Single Proprietorship		
		Employer's Registration	Once	
Home Development Mutual Fund		Membership Registration/ Member's Data Form		This is only for local employees
		Remittance Form		
Metro Manila Development Authority		Business Permit		This is only for firms located in Metro Manila
		Locational Clearance		
Philippine Economic Zone Authority		Permit to Locate		If applicable
		Registration with other investment promotion agencies for availing of incentives		This is applied only by ecozone business locators
Philippine Health Insurance Corporation		Employer Data Record	Once	
		Member's Data Form		This is only for local employees
Securities and Exchange Commission		Registration of Corporations and Partnerships		
		Registration of Foreign Corporations		
Social Security System		Employees' Registration		
		Employer Registration	Once	
		Specimen Signature Card		

ANNEXES

ANNEX 4A. LIST OF CLEARANCES, PERMITS AND ISSUING GOVERNMENT AGENCIES

PRE-CONSTRUCTION				
AGENCY	SPECIFIC OFFICE/ BUREAU IN-CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
Bureau of Fire Protection	City/Municipality Fire Marshal	Fire Safety Evaluation Clearance		The C/MFM having jurisdiction shall review, evaluate and assess plans, design calculations and specifications, and issue the necessary building Fire Safety Evaluation Clearance (FSEC) as a prerequisite for the issuance of Building Permit by the Office of the Building Official, upon determination that design and specification is in accordance with RA 9514 and its RIRR.
Civil Aviation Authority of the Philippines	CAAP Central Office - Aerodome Development and Management Service	Height Clearance Permit	Once	For smokestack
Department of Agrarian Reform	DAR Central Office - Center for Land Use Policy, Planning and Implementation (CLUPPI) / DAR Regional Office - Regional CLUPPI/DAR Provincial Agrarian Reform Office	Certificate for Land Use Reclassification		For agricultural lands
		Land Use Conversion Permit		
Department of Energy	Oil Industry Management Bureau	Monthly Progress Report and operational meeting	Monthly	Refer to Annexes A and B of PDNGR
		Notice to Proceed	Once; No prejudice to reapply if denied the first time; 6 months validity subject to renewal for 6 months	

PRE-CONSTRUCTION				
AGENCY	SPECIFIC OFFICE/ BUREAU IN-CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
Department of Energy	Oil Industry Management Bureau	Permit to Construct, Expand, Rehabilitate, and Modify		
Department of Environment and Natural Resources	DENR Central Office for naturally-growing trees	Tree Cutting Permit	Once	Specific office for types of trees still for verification with the DENR Central Office
	DENR Regional Office for planted trees			
		Miscellaneous/Foreshore Lease Contract	Once with validity of twenty-five (25) years May be renewed for another twenty-five (25) years	
	DENR Regional Office	Special Land Use Permit (SLUP)	Once with maximum validity of three (3) years and non-renewable	Should there be a need to extend the duration of the SLUP, the same should be converted to Forest Land Use Agreement (FLAg) pursuant to DENR Memorandum Order 537 dated 29 November 2013.
	DENR-EMB Central Office	Importation Clearance	Once every six (6) months	If applicable
		Integrated Persistent Organic Pollutants Management (IPOP)s Project		If applicable
		Ozone Depleting Substances and Alternative Chemicals		If applicable
		Pre-Manufacture and Pre-Importation Notification Certificate		If applicable
		Priority Chemical List Compliance Certificate		If applicable
		Small Quantity Importation	Once with validity of one (1) year	If applicable

ANNEXES

ANNEX 4A. LIST OF CLEARANCES, PERMITS AND ISSUING GOVERNMENT AGENCIES

PRE-CONSTRUCTION				
AGENCY	SPECIFIC OFFICE/ BUREAU IN- CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
Department of Environment and Natural Resources	DENR-EMB Central Office for Category A (environmentally- critical) projects	Environmental Compliance Certificate or Certificate of Non- Coverage	ECC: Once with validity of five (5) years	ECC: This permit requires public consultation.
	DENR-EMB Regional Office for Category B (non- environmentally- critical) projects		CNC: Once	This permit requires documents such as but not limited to the following: - Discharge Permit - Permit to Operate for Air Pollution Source and Control Installation - Treatment, Storage, and Disposal Permit - Toxic/Hazwaste/ Healthcare Waste Generator ID - Transporter Registration Certificate - Environmental Management Plan
	DENR-EMB Regional Office	Chemical Control Order		CNC: Issued by the DENR if the project is covered by EIS
		Hazwaste Manifest System		If applicable
		Pollution Control Officer Accreditation/ Appointment	Annual per officer	
		Permit to Construct/ Operate Pollution Control Devices		
		Registration and permit to operate		

PRE-CONSTRUCTION				
AGENCY	SPECIFIC OFFICE/ BUREAU IN-CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
Department of Labor and Employment	Central Office - Bureau of Working Conditions	Application for Fabrication of Boilers	Once per unit	
		Application for Fabrication of Pressure Vessels	Once per unit	
	Central Office - Bureau of Working Conditions / Regional Office with Professional Mechanical Engineer	Permit to Operate Mechanical Equipment 1. Steam/Gas/Hydro turbine 2. Boilers 3. Pressure vessel 4. Power piping lines 5. Elevator/Manlift/ Dumbwaiter 6. Internal combustion engine 7. Crane and hoist	Once per equipment	Application for this requires Cleared Plans
	Regional Office	Approved Construction Safety and Health Program	Once per project	Application shall be submitted prior the start of the project at Regional/ Provincial Office where the project will be constructed.
		Application for Electrical Wiring Installation	Once per unit	Application for this requires Cleared Plans
		Certificate of Electrical Inspection (CEI)	Annual	Application for this requires Cleared Plans for Electrical Wiring Installation
		Installation Clearance	Once per unit	This clearance is applied for every renovation in a building
	Barangay	Barangay Clearance	Once with validity of six (6) months	This permit includes stakeholder consultations before being issued

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ANNEX 4A. LIST OF CLEARANCES, PERMITS AND ISSUING GOVERNMENT AGENCIES

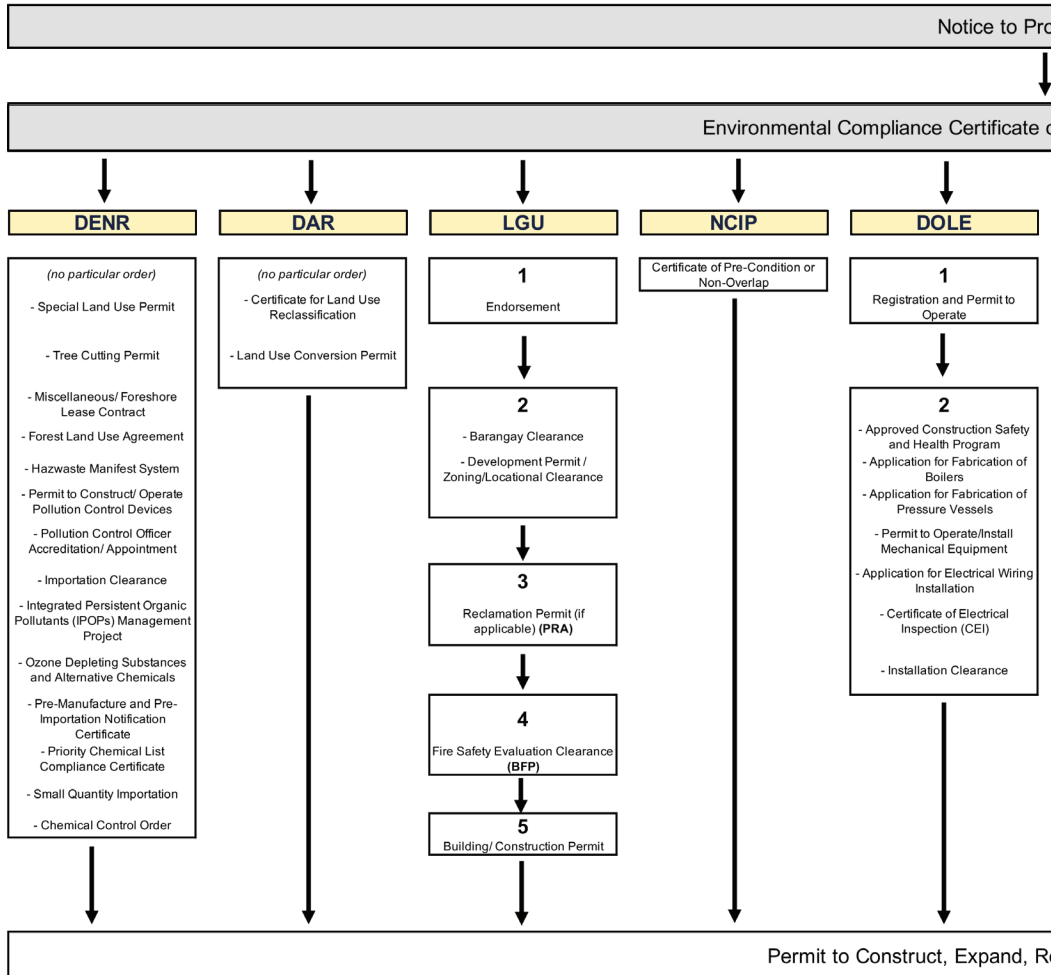
PRE-CONSTRUCTION				
AGENCY	SPECIFIC OFFICE/ BUREAU IN- CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
Local Government Unit	City/Municipality Planning and Development Office	Building / Construction Permit	Once (A building permit shall expire and become null and void if the building or work is not commenced within a period of one (1) year from the date of receipt of permit, or if the building or work is suspended or abandoned at any time after it has been commenced, for a period of 120 days.)	This permit requires documents such as but not limited to the following: - Barangay Clearance - Fire and Zoning Clearance from the local fire station - Construction Safety and Health Plan/Program - City Environmental Certificate - Installation Permit from DOLE-BWC This permit also requires simultaneous application for: - Electrical Permit - Sanitary Permit - Mechanical Permit
		Development Permit/ Zoning/Locational Clearance	Once	This requires an ECC, Barangay Clearance, and LGU Endorsement through the Sangguniang Panlungsod/ Pambayan Endorsement
		Endorsement		
National Commission on Indigenous Peoples	NCIP Regional/ Field Office	Certificate of Pre-Condition or Non-overlap	Once	

PRE-CONSTRUCTION				
AGENCY	SPECIFIC OFFICE/ BUREAU IN- CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
National Water Resources Board	Office of the DPWH District Engineer; NIA Provincial Irrigation Engineer; NPC Regional Manager; or the LWUA Water District General Manager	Water Permit	Once with validity one (1) year	
	Policy and Program Division (PPD) Water Assessment Section	Certificate of Water Availability		This is a requirement in application for Water Permit
Philippine Coast Guard	PCG Districts through the Marine Environmental Protection Unit (MEPU)	Special Permit to Dump/ Discharge Waste and/or Other Matters (for vessels or land-based)	Per voyage	Certificate will be applied to the PCG District of the project location
	Maritime Safety Services Command (MSSC)/ PCG Districts	Certificate of Aids to Navigation (ATON)	Once	Application depends on the assessment and recommendation of MSSC/PCG District
Philippine Ports Authority	PPA Port Management Office/PPA Head Office Commercial Services Department	Clearance to Develop Private Port Facility	Once	
	PPA Port Management Office Engineering Services Division	Permit to Construct Private Port Facility	Once	
Philippine Reclamation Authority		Reclamation Permit (only if applicable)	Once with validity of one (1) year	

ANNEXES

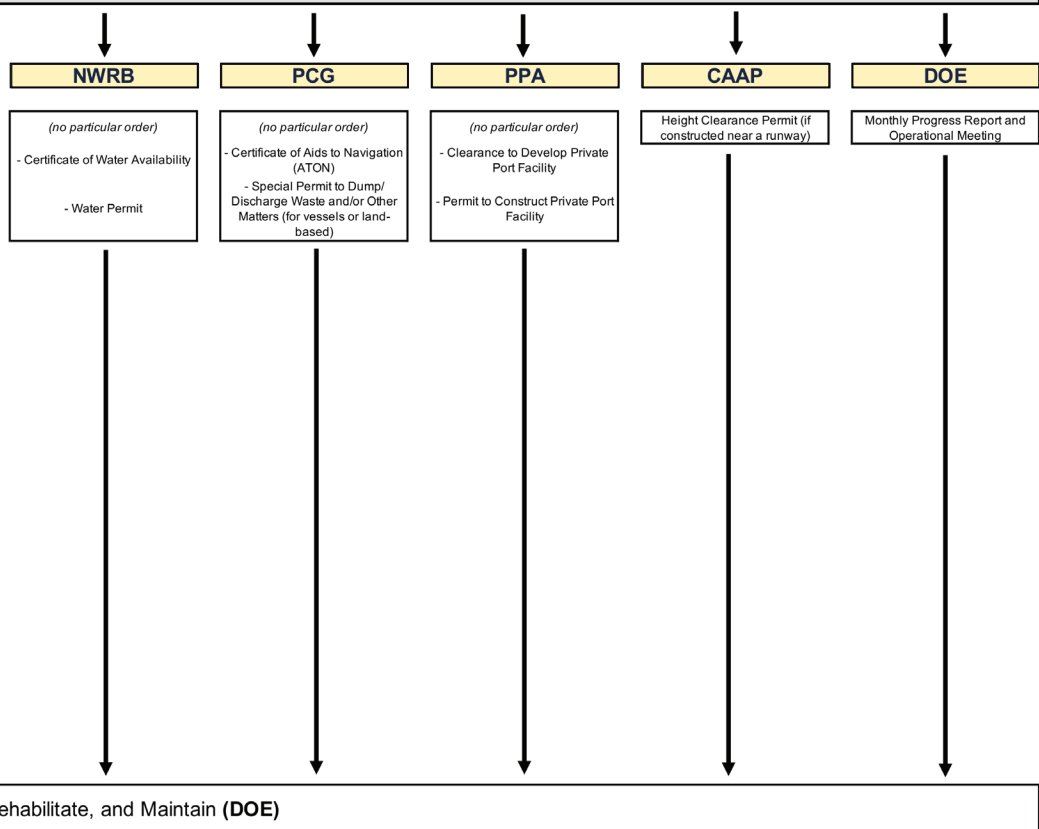
The succeeding tables below identify the sequential list of permits for every stage of LNG project development.

1. PRE-CONSTRUCTION



Proceed (DOE)

or Certificate of Non-Coverage (DENR)



ANNEXES

CONSTRUCTION				
AGENCY	SPECIFIC OFFICE/ BUREAU IN- CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
Bureau of Fire Protection	City/Municipality Engineer's Office	Installation Clearance		This clearance is applied for every renovation or alteration in a building.
				This is a stand-alone application.
				For installation of gas and flammable and combustible liquid systems other than at bulk premises, installation of equipment, utilities, facilities mentioned in Section 10.2.7.1 to Section 10.2.7.5 of this RIRR of the Fire Code of the Philippines, and installation of fire protection and warning systems.
Department of Energy	Oil Industry Management Bureau	Monthly Progress Report and operational meeting	Monthly	Refer to Annexes A and B of PDNGR
		Permit to Operate and Maintain	Once	
Department of Environment and Natural Resources	DENR-EMB Central Office	Hazardous Waste Generator's ID	Once	
	DENR-EMB Central Office/ DENR-EMB Regional Office	Semi-Annual Compliance Monitoring Report	Semi-annual	
	DENR-EMB Regional Office	Permit to Operate Air Pollution Source, and Control Installation		
		Quarterly Self-Monitoring Report	Quarter	

CONSTRUCTION				
AGENCY	SPECIFIC OFFICE/ BUREAU IN- CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
		Waste Water Discharge Permit		
Department of Labor and Employment	Regional Office	Company Occupational Safety and Health (OSH) Administrative Reports	Annual/Monthly	
Philippine Ports Authority		Permit to Operate		
		Waste Reception Facility (segregation, sewage, etc.)		

2. CONSTRUCTION

DOE

(no particular order)

- Permit to Operate and Maintain
- Monthly Progress Report and Operational Meeting

DOLE

(no particular order)

- Company Occupational Safety and Health (OSH) Administrative Reports

DENR

(no particular order)

- Semi-Annual Compliance Monitoring Report
- Hazardous Waste Generator's ID
- Quarterly Self-Monitoring Report
- Permit to Operate Air Pollution Source, and Control Installation
- Wastewater Discharge Permit

PPA

(no particular order)

- Permit to Operate
- Waste Reception Facility (segregation, sewage, etc.)

BFP

Installation Clearance

OPERATION				
AGENCY	SPECIFIC OFFICE/ BUREAU IN- CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
Bureau of Fire Protection	City/Municipality Engineer's Office	Conveyance Clearance		Conveyance Clearance shall be issued to vehicles transporting any explosives, flammable liquids and combustible materials over streets, water, or through pipelines, to load and unload such explosives, flammable liquids or combustible materials in or from any vessel, boat, craft, or railway upon payment of fee based on their capacity by the owner of vehicles transporting flammable or combustible materials during his/her application for FSIC for business operation at his/her principal place of business.
		FSIC for Business Permit (New/Renewal)		Fire safety inspections shall be conducted as a pre-requisite to grants of permits and/or licenses by local governments or other government agencies. No Certificate of Occupancy, Business or Permit to Operate shall be issued without securing a Fire Safety Inspection Certificate (FSIC) from the City/Municipal Fire Marshal having jurisdiction.
		FSIC for Certificate of Occupancy, and other clearance for the conduct of Welding, Cutting, and Other Hotworks		
		Storage Clearance		Storage of Flammable and Combustible Solid/ Liquids

OPERATION				
AGENCY	SPECIFIC OFFICE/ BUREAU IN-CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
Department of Energy	Oil Industry Management Bureau	Monthly Progress Report and Operational Meeting	Monthly	
Department of Environment and Natural Resources	DENR-EMB Regional Office	Quarterly Self-Monitoring Report	Quarterly	
		Renewal of Permit to Operate Air Pollution Source, and Control Installation		
		Semi-Annual Compliance Monitoring Report	Semi-annual	
Department of Labor and Employment	Regional Office	Registration of Establishment	Once	
		Certificate of Electrical Inspection (or Renewal of Certificate of Electrical Inspection)		This may be applied at the City/Municipality Engineer's Office if located in chartered cities such as Batangas City
		Company Occupational Safety and Health (OSH) Administrative Reports	Annual/Monthly	
		Company Occupational Safety and Health Program	Once or when needed	
		Permit/s to Operate (PTOs) for Mechanical Equipment		
Lighterage Association of the Philippines		Certificate of No Objection		This is a prerequisite to the application for MARINA Exemption Permit of foreign-registered rig/vessels. Processing time is approximately two (2) to four (4) weeks.
Local Government Unit	City/Municipality Health Office	City/Municipal Sanitary Permit	Annual	For Batangas City, this permit is released simultaneously with the Business Permit.

OPERATION				
AGENCY	SPECIFIC OFFICE/ BUREAU IN- CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
Local Government Unit				<p>This may be applied simultaneously with Occupancy Permit.</p> <p>This permit also requires documents such as but not limited to the following:</p> <ul style="list-style-type: none"> - Zoning Clearance - City Environmental Certificate (CEC)* - Occupancy Permit - Certificate of Annual Inspection - Occupying Space Certification
	City/Municipality Planning and Development Office	Business Permit	Annual	<p>*Prerequisites of the CEC include but are not limited to:</p> <ul style="list-style-type: none"> - Cutting/Trimming/Pruning Permit - Social Acceptability - DENR Environmental Compliance Certificate (ECC) or Certificate of Non-Coverage (CNC) - Greening/Landscaping Plan - Building Design and Specification - Local and national government clearance for (1) raining or lowering water level; and (2) water drilling or deepwell installation
	City/Municipality Planning and Development Office/Engineer's Office	Occupancy Permit	Once	This permit requires an approved Building/Construction Permit.
Maritime Industry Authority		Exemption Permit		

OPERATION				
AGENCY	SPECIFIC OFFICE/ BUREAU IN- CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
Philippine Coast Guard	Marine Environmental Protection Command (MEPCOM)	Oil Spill Contingency Plan	Renewal whenever there is major revision	For land-based. Application through National Operation Center for Oil Pollution (NOCOP) and Marine Environmental Protection Unit (MEPU)
		Shipboard Oil Pollution Emergency Plan (SOPEP)	Every three (3) years	For vessel. Application through NOCOP
		Oil Record Book (Part I and II)	Until all pages are used	
		Garbage Management Plan (GMP)	Every five (5) years	
		Garbage Record Book (GRB)	Until all pages are used	
		Permit to Conduct Tank Cleaning Operations	Per operations	For vessel
		Oil Water Separator (OWS) Certificate	Every three (3) years	For vessel. Application to NOCOP through MEPUs
		Internations/Oil Pollution Prevention Certificate (IOPPC/OPPC)	Every five (5) years	For vessel. Application through NOCOP/ MERDC/MEPUs
		International/Sewage Pollution Prevention Certificate (ISPPC/SPPC)	Every five (5) years	For vessel
	Maritime Safety Services Command (MSSC)	Notice to Mariners (if special activities to port)		Proper dissemination to mariners regarding the conduct of special marine activities

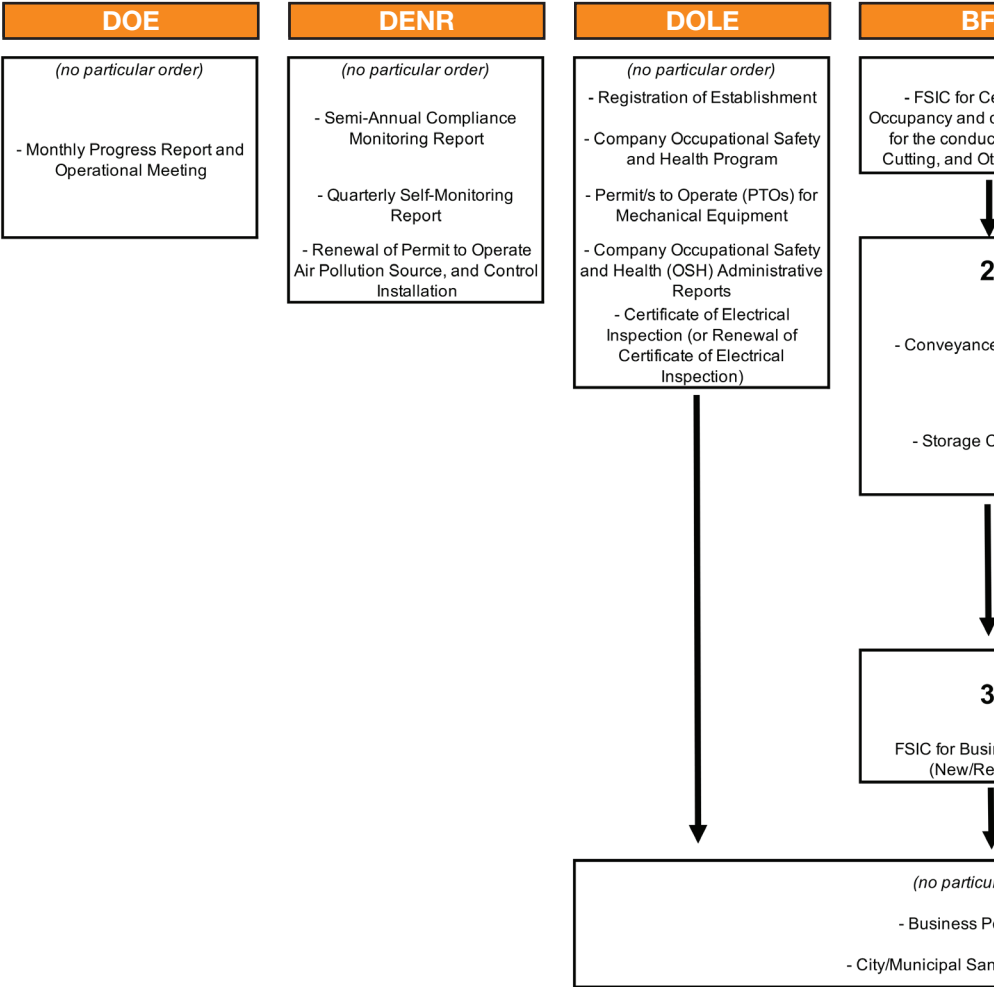
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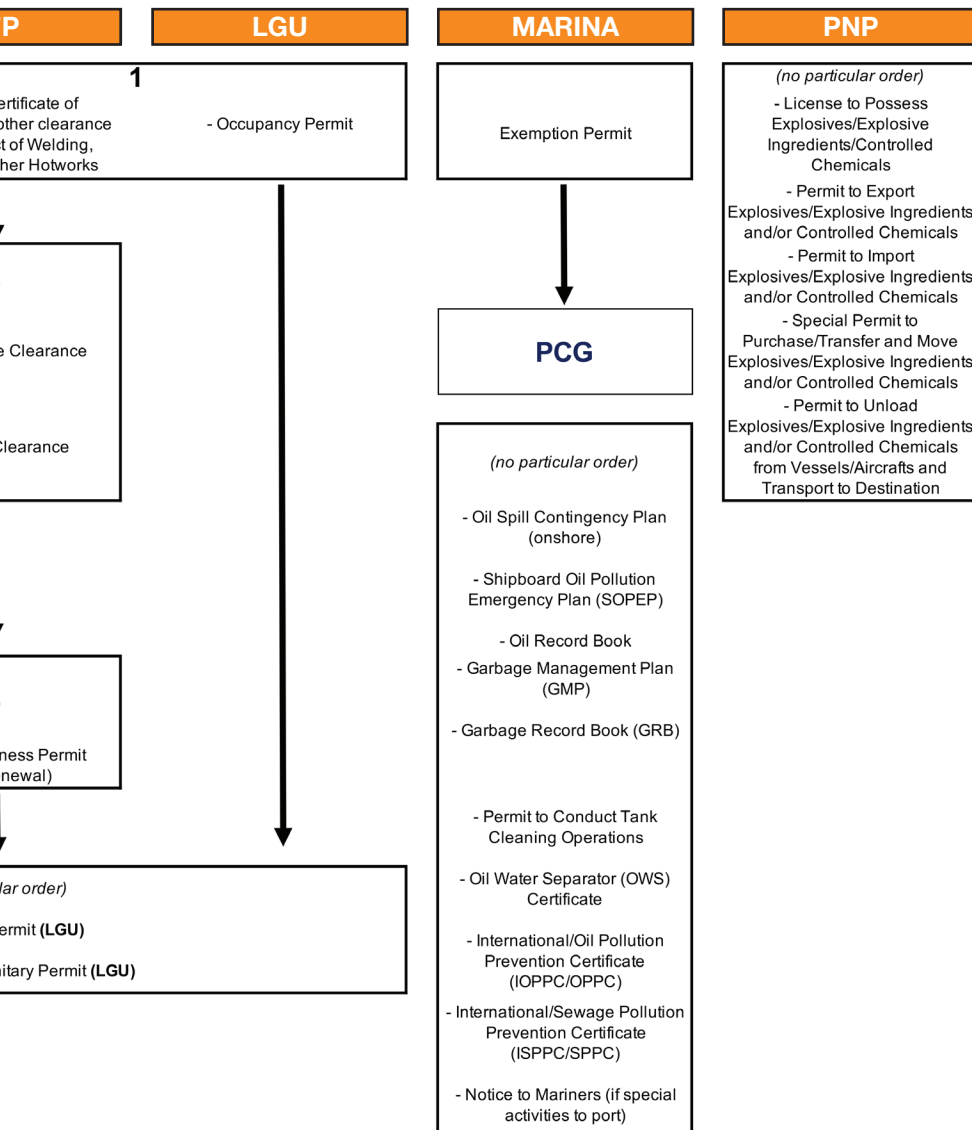
OPERATION				
AGENCY	SPECIFIC OFFICE/ BUREAU IN- CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
Philippine Coast Guard	Marine Environmental Protection Command (MEPCOM)	Oil Spill Contingency Plan	Renewal whenever there is major revision	For land-based. Application through National Operations Center for Oil Pollution (NOCOP)/MEPUs
		Shipboard Oil Pollution Emergency Plan (SOPEP)	Every three (3) years	For vessel. Application through NOCOP
		Oil Record Book (Part 11 and II)	Until all pages are used	
		Garbage Management Plan (GMP)	Every five (5) years	
		Garbage Record Book (GRB)	Until all pages are used	
		Permit to Conduct Tank Cleaning Operations	Per operations	For vessel
		Oil Water Separator (OWS) Certificate	Every three (3) years	For vessel. Application to NOCOP through MEPUs
		Internations/Oil Pollution Prevention Certificate (IOPPC/OPPC)	Every five (5) years	For vessel. Application through NOCOP/ MERDC/MEPUs
		International/Sewage Pollution Prevention Certificate (ISPPC/SPPC)	Every five (5) years	For vessel
	Maritime Safety Services Command (MSSC)	Notice to Mariners (if special activities to port)		Proper dissemination to mariners regarding the conduct of special marine activities

OPERATION				
AGENCY	SPECIFIC OFFICE/ BUREAU IN- CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
Philippine National Police		License to Possess Explosives/Explosive Ingredients/Controlled Chemicals		
		Permit to Export Explosives/ Explosive Ingredients and/or Controlled Chemicals		
		Permit to Import Explosives/ Explosive Ingredients and/or Controlled Chemicals		
		Permit to Unload Explosives/ Explosive Ingredients and/ or Controlled Chemicals from Vessels/Aircrafts and Transport to Destination		
		Special Permit to Purchase/ Transfer and Move Explosives/Explosive Ingredients and/or Controlled Chemicals		

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3. OPERATION





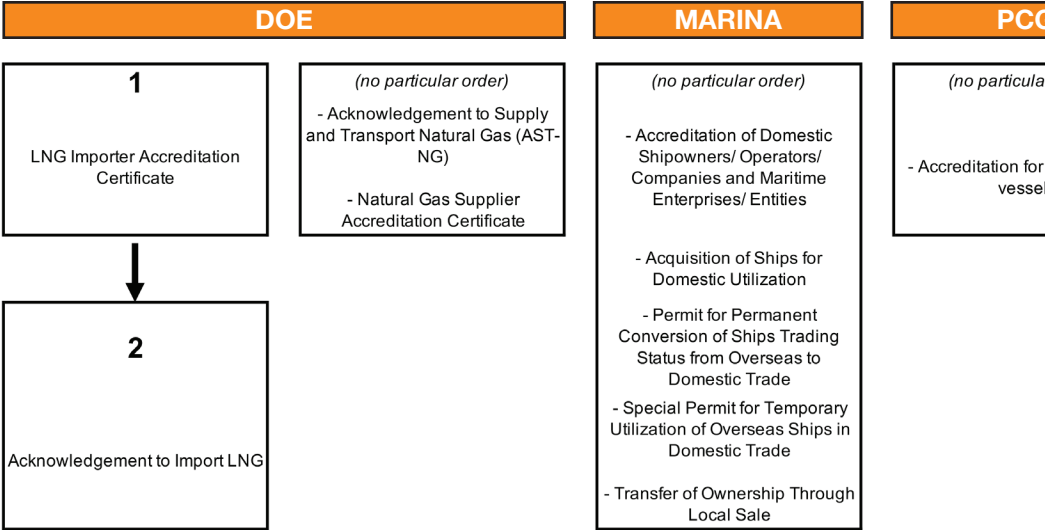
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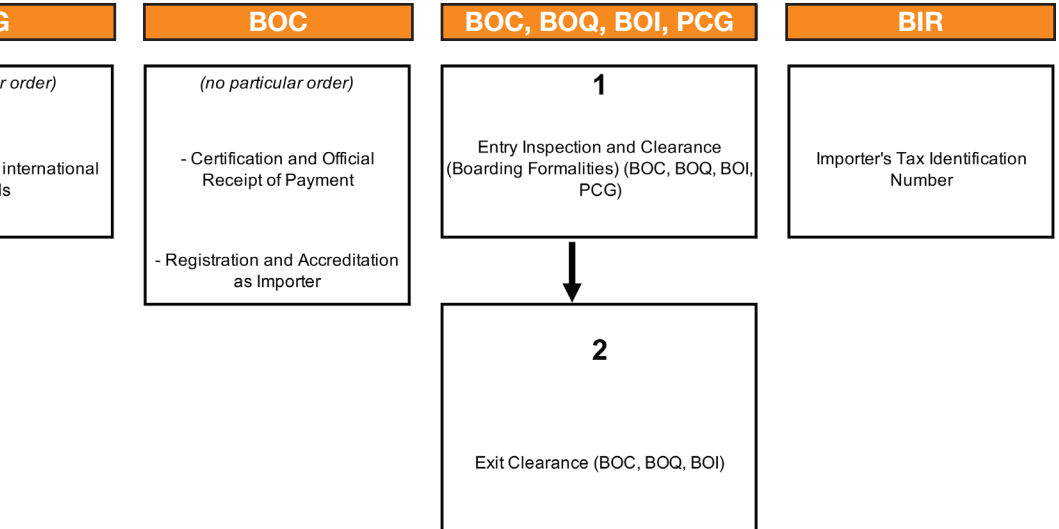
ACCREDITATION AND IMPORTATION				
AGENCY	SPECIFIC OFFICE/ BUREAU IN- CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
Bureau of Customs		Certification and Official Receipt of payment	Once	These are still subject to verification with the BOQ, BOC, BOI, and BI.
		Registration and Accreditation as Importer	Once	
Bureau of Internal Revenue		Importer's Tax Identification Number	Once	
Bureau of Quarantine, Bureau of Customs, Board of Investments, Philippine Coast Guard		Entry Inspection and Clearance (Boarding Formalities)		
Bureau of Quarantine, Bureau of Customs, Bureau of Immigration		Exit Clearance		
Department of Energy	Oil Industry Management Bureau	LNG Importer Accreditation Certificate	Once	
		Acknowledgement to Import LNG	Every importation	
		Acknowledgement to Supply and Transport Natural Gas	Every transaction	
		Natural Gas Supplier Accreditation Certificate	Once	

ACCREDITATION AND IMPORTATION				
AGENCY	SPECIFIC OFFICE/ BUREAU IN- CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
Maritime Industry Authority	Domestic Shipping Service	Accreditation of Domestic Shipowners/ Operators/ Companies and Maritime Enterprises/ Entities	Once every three (3) years	
		Acquisition of Ships for Domestic Utilization	Once per ship	
		Permit for Permanent Conversion of Ships Trading Status from Overseas to Domestic Trade	Once per ship	
		Special Permit for Temporary Utilization of Overseas Ships in Domestic Trade	Depends on the request of the client, as long as it is within the timeline of the valid and current contract	This permit is only for overseas/foreign-flagged vessels that will operate/trade domestically but do not want to change flags.
		Transfer of Ownership Through Local Sale	Once per ship	This application is an approval/pre-requisite for the issuance of Certificate of Ownership/Philippine Registry
Philippine Coast Guard	Port State Control (PSC)	Accreditation (for international vessels)	Once with validity of two (2) years	For verification with the PCG through the MSSC-CG-8

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4. ACCREDITATION AND IMPORTATION





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For power projects, some additional requirements required by the Energy Regulatory (ERC) are indicated below.

POWER				
AGENCY	SPECIFIC OFFICE/ BUREAU IN- CHARGE	PERMIT/CLEARANCE	FREQUENCY OF APPLICATION/ VALIDITY	REMARKS
Energy Regulatory Commission		Certificate of Authority for WESM Metering Service Providers		
		Certificate of Compliance		
		Registration of Wholesale Aggregators		
		Retail Electricity Suppliers' License		

ANNEX 4B. CONTACT DETAILS OF OFFICES ISSUING PERMITS, LICENSES AND CLEARANCES

AGENCY	OFFICE	EMAIL ADDRESS
Bangko Sentral ng Pilipinas		bspmail@bsp.gov.ph
Board of Investments	Office of the Executive Director	ask@dti.gov.ph
Bureau of Customs	CD4, Port of Batangas	info@customs.gov.ph; boc.cares@customs.gov.ph
Bureau of Fire Protection	Fire Science and Technology Division (FSTD)	fssddbfp@yahoo.com.ph bfpnhq_pis@yahoo.com
Bureau of Immigration	Alien Registration Division	xinfo@immigration.gov.ph; binoc_ immigration@hotmail.ph; immigPH@gmail.com
Bureau of Internal Revenue		contact_us@bir.gov.ph
Bureau of Quarantine		bureauofquarantine@gmail.com
Civil Aviation Authority of the Philippines	CAAP Central Office	information@mis.caap.gov.ph
Cooperative Development Authority	Registration Division	registration@cda.gov.ph
Department of Agrarian Reform	DAR Central Office	deptsecretary@dar.gov.ph
	DAR Provincial Office (Batangas)	parpo2batangas@dar.gov.ph
	DAR Regional Office (CALABARZON)	rd.04a@dar.gov.ph
Department of Energy	Energy Utilization Management Bureau	doe.eumb@gmail.com
	Oil Industry Management Bureau - Natural Gas Management Division	doe.oimb.ngmd@gmail.com
Department of Environment and Natural Resources	DENR Regional Office (Region IV-A CALABARZON)	denr4a.ord@gmail.com
	Environmental Management Bureau (Central Office)	emb@emb.gov.ph
	Environmental Management Bureau (Region IV-A Office)	emb_calabarzon@yahoo.com; calabarzon@emb.gov.ph
	Forest Management Bureau	officeofthedirector.fmb@gmail.com
Department of Labor and Employment	Central Office - Bureau of Local Employment	od_ble@yahoo.com
	Central Office - Bureau of Working Conditions	bwcsecretary@gmail.com
	Regional Office (Region IV-A)	dolero4a@gmail.com; dole4imsd@yahoo.com; tssd.dole4a@yahoo.com.ph
Department of Trade and Industry		ask@dti.gov.ph
Home Development Mutual Fund		contactus@pagibigfund.gov.ph
Lighterage Association of the Philippines		lap.inc_phils@yahoo.com

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ANNEX 4B. CONTACT DETAILS OF OFFICES ISSUING PERMITS, LICENSES AND CLEARANCES

AGENCY	OFFICE	EMAIL ADDRESS
Local Government Unit	Batangas City Engineer's Office	
	Batangas City Health Office	info@batangascity.gov.ph
	Batangas City Planning and Development Office	
	Sangguniang Panlungsod/Pambayan	
Maritime Industry Authority	Domestic Shipping Service (DSS)	dss@marina.gov.ph
	Maritime Safety Services (MSS)	mss@marina.gov.ph
Metro Manila Development Authority		email@mmda.gov.ph
National Commission on Indigenous Peoples	NCIP Regional Office (Region IV)	region4ncip@gmail.com
National Water Resources Board		nwrsec@nwr.gov.ph; nwrphil@gmail.com
Philippine Coast Guard	Marine Environmental Protection Command (MEPCOM)	mepcom@coastguard.gov.ph; merdc.mepcom2016@gmail.com
	Maritime Safety Services Command (MSSC)	mssc@coastguard.gov.ph
	National Operation Center for Oil Pollution (NOCOP)	mepcom@coastguard.gov.ph
	Port State Control (PSC)	ncrcld@coastguard.gov.ph; ncrcl3@gmail.com
		ncrclemepgru@yahoo.com
	Southern Tagalog Coast Guard District (Batangas Coast Guard Station - Batangas City Substation)	cgsbatangas@yahoo.com; cgssbatcity@gmail.com
Philippine Health Insurance Corporation	Regional Office (Region IV-B - Batangas)*	region4b@philhealth.gov.ph
Philippine National Police	Firearms and Explosives Office	feocsg@pnp.gov.ph
Philippine Ports Authority	PPA Head Office - Commercial Services Department	ogm@ppa.com.ph
	PPA Port Management Office - Batangas	
Philippine Reclamation Authority		info@pea.gov.ph
Securities and Exchange Commission	Corporate and Partnership Registration Division	imessagemo@sec.gov.ph
Social Security System		member_relations@sss.gov.ph

ANNEX 5. OPERATOR AND FACILITY REGISTRY AND REPORTORIAL REQUIREMENTS GUIDELINE²⁷

a. NTP Holder

1. Monthly Progress Report

The Operator shall submit a monthly progress report on the status of the permitting, clearances and financial closing acquisition to the ONG-REC, copy furnished the Department of Energy- Oil Industry Management Bureau, Department of Energy (DOE-OIMB), on or before the fifteenth (15th) day of the succeeding month.

b. PCERM Holder

1. Monthly Progress Report

During construction / expansion / rehabilitation / modification of the Project the Permit holder shall submit a monthly progress report to the ONG-RE C, copy furnished the DOE-OIMB, on or before the fifteenth (15th) day of the succeeding month.

This Report shall include, among others, the following;

- i. Gantt chart showing the rate of completion based on the construction timeline;
- ii. Summary of ongoing site activities, schedules and photos;
- iii. Compliance update report to Government permitting, clearances and obligations; and
- iv. Update Report on issues and challenges encountered during the month.

2. Lost-Time Incident Report

The Operator shall report to the ODG-REC, copy furnished the DOE- OIMB on any lost-time incident situation and the corresponding action/s taken or to be undertaken within twenty-four (24) hours from the time the Applicant has been made aware of the situation.

²⁷ See Annex B of DOE Department Circular 2017-11-0012 or Philippine Downstream Natural Gas Regulation.

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c. POM Holder

1. Registry

The DOE-OIMB shall maintain a registry of all Downstream Natural Gas Facility Operators, their buildings, facilities and equipment. For this purpose, all Operators are required to submit on or before the fifteenth (15th) day of January Annual facility update report containing, among others, the following:

- i. Updated Management Profile; and
- ii. Inventory of building, facilities and equipment and their operational and disposal status

2. Reportorial Requirements to be submitted to the DNG-REC, copy furnished the DOE- OIMB, on or before the fifteenth (15th) day of the succeeding month

- i. Monthly Operation Report

The Report shall include, but not limited to, the following:

- a. Operational Performance;
 - b. Planned or Projected System Availability and Maintenance Schedule (for the next two years);
 - c. Production output;
 - d. Goal-zero Milestones/Days since Loss Time Incident (LTI);
 - e. Key developments/Highlights and Lowlights; and
 - f. HSSE Integrity Performance
- ii. Lost-Time Incident Report

The Operator shall report any lost-time incident situation and the corresponding action/s taken or to be undertaken within twenty-four (24) hour from the time the Applicant has been made aware of the situation.

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