Development Plans in the Emerging Downstream Natural Gas Industry

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Presentation Outline

- I. Overview of the Downstream Natural Gas Industry
- II. Policy Thrust/Directions
- III. Development Plans and Programs
- IV. Challenges in the Development Plans

Overview of the Downstream Natural Gas Industry



414 MW San Gabriel First Gen/ IPP



Shell Refinery



Malampaya Gas Field 2.7 TCF (2001)



Libertad Gas Field 0.6 BCF (2012)



97 MW Avion First Gen/ IPP



560 MW San Lorenzo First Gen/ IPP



1,000 MW Sta. Rita



1,200 MW Ilijan Power Plant NPC IPP(KEPCO)



IMPLEMENT. **MONITOR AND** INTEGRATE SECTORAL AND ROADMAPS AND ACTION

ENERGY

3 **LOW CARBON FUTURE**

COLLABORATION AMONG ALL GOVERNMENT IN ENERGY

FOSTER **STRONGER INTERNATIONAL RELATIONS** AND

STRENGTHEN AGENCIES INVOLVED

DOWNSTREAM NATURAL GAS INDUSTRY ROADMAP

(2016-2017)

(2018-2020)

(2021-2030)

Tender or sale of remaining volume of PNOC banked gas and new gas of Malampaya

Malampaya

Award three
(3) SC as a
result of PECR -5

Orilling and
testing of SC 37

Declaration of

Declaration or Commerciality of SC 49
 LNG importation by Energy World Corp. (EWC) with one storage tank

 Commercial production of SC 49 SC 49 Drilling of Malampaya East Commercial use of gas

seepages

Distribution of LNG to satellite terminals in off-grid

peration of LNG Termina

Phase 1, construction o Phase 2 in Bataan and

islands

Distribution of LNG Supply in Visayas and Mindanao

INFRASTRUCTURE DEVELOPMENT

Infrastructure Program for

Malampaya 400 MW LNG power Plant by EWC

· CNG Vehicles to

Phase 1 or Shell FSRU in Batangas

of EWC Power Plant 400 MW Floating Power Plant of Vires Proposed 450-MW as anchor for the Shell FSRU

Phase 2 in Sabaha and Sabaha and Sabaha Cavity Populars, Baban-Cavity Populars, Baban-Sabc Pipeline, Baban-Sabc Pipeline, Deparation of Baban-Hanila and distribution lines for the transport action. Operation of Sabaha Cavity Populars of Sabaha Cavity P

Commissioning of :
- additional 800-HW
Greenflest LNG Batan
(Totals-2-400-HW)
- Correctional Society of the Correction o

Manila vehicles envisaged to have shifted to CNG

Initial 3 Ecozones in Batangas and Laguna to use natural gas Evolution of LNG Cold storage business Use of Adsorbed Natural Gas I(ANG)

Additional Ecozones/industries to use natural gas CNG applications in fishing boats and interistand passengers marine vassels
 Additional use of CNG in provincial buses
 Application of natural gas in commercial and residential sectors

the Energy

Institute Commercia

operation of the

Institute and institutionalize

training/skills

program and other services of the Energy Institute

industry Exchange program/on the job training for actual exposure of identified key regulator to develop the long term skills program for natural gas

· Create TWG for the standards on

Bilateral partnership with Academe and Industries to map out technical, legal/regulatory and commercial skills to develop and required in the

ndustry Bilateral partnership with

organization/institute for technological exchange leading towards skills development and enhancement for the

ancillary facilities Final draft of PNS on

BPS promulgation Draft DC on rules to implement the PNS or transmission and

distribution pipeline LNG facility and

Draft IRR for the Natural Gas Bill
 Update the development plan for

technologies related to the transportation and storage of natural gas • Continuing updating of PNS on natural gas facilities

EXPAND ACCESS

> PROMOTE A **LOW CARBON FUTURE**

STRENGTHEN CONSUMER WELFARE AND 7PROTECTION

PARTNERSHIPS



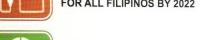




DOE'S NINE POINT ENERGY AGENDA



ACCESS TO BASIC ELECTRICITY **FOR ALL FILIPINOS BY 2022**



ADOPTING A TECHNOLOGY NEUTRAL **APPROACH FOR AN OPTIMAL ENERGY MIX**



IMPROVING THE SUPPLY OF POWER THAT IS RELIABLE, TO MEET DEMAND NEEDS BY



DEVELOPING LNG NEEDS FOR THE FUTURE IN ANTICIPATION OF THE MALAMPAYA DEPLETION



FACILITATING THE COMPLETION OF TRANSMISSION PROJECTS BY 2020



PRO-CONSUMER DISTRIBUTION FRAMEWORK FOR AFFORDABILITY, CHOICE AND TRANSPARENCY



STREAMLINING DOMESTIC POLICY TO CUT RED TAPE



DOE TO DELIVER ON PSALM **PRIVATIZATION**



PROMOTING EFFICIENT USE OF POWER AMONG CONSUMERS THROUGH AN IEC



POLICY DEVELOPMENT

MARKET DEVELOPMENT

required for the natural

Expand the use of gas to transport, industrial, Commercial, Residential

support natural gas

program implementat on and

Revisit the Magna Carta Bill for Energy Workers instituting the development of Energy Institute and advocate its passage Revisit the proposed Nat Gas for

Draft supplemental guidelines to import LNG of the DC 2002-08-005

08-005

Draft DC on rules to implement the PNS on Natural Gas Quality

Draft DC to implement HSSE practices in the

natural gas industry as a requirement in the Natural Gas Bill Update Natural Gas Develop standard or

To increase the utilization of natural gas:

Expand Supply Source

-intensifying exploration for indigenous gas deposits and studying options for economically using imported LNG

Market Development

 vigorously promoting its use in the transportation, commercial and residential sectors

Develop Critical Infrastructures

- that will efficiently deliver gas to the demand centers

Establish Public-Private Partnership

- continue to encourage the private sector to assist government in developing the natural gas industry.

Capacity Building

- develop skills and competencies to manage the industry





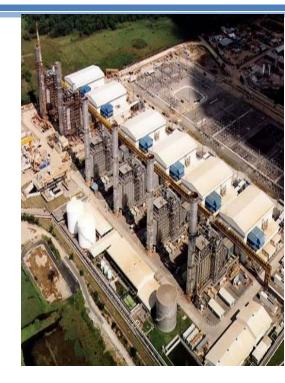






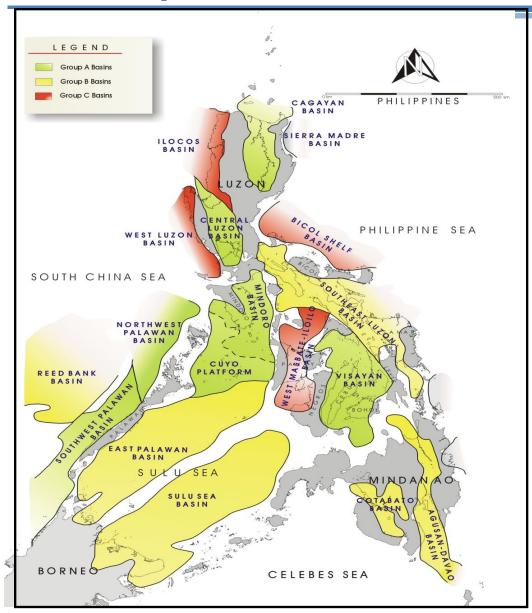


- Malampaya has six gas sales and purchase agreements
- Fuels 2,700 MW of power stations as baseload resources for the most part and additional 500+ MW operating as mid-merit and peaking plants and a refinery
- Inflexible output from Malampaya with an average production of 380 million standard cubic feet (mmscf) per day
- Given the production level and continuous drop in pressure, drop in supply is expected in 2022.





- ➤ Recoverable Reserve end of field life is 3.08 to 3.29 TCF
- ➤ The Malampaya concession expires in 2024 and while it may have enough gas for some further expansion, this is not considered sufficient for more than about 5 years to provide the future natural gas requirements particularly on the plan to expand the application of natural gas in industrial, commercial, residential and transport sectors.



PETROLEUM BASIN PROSPECTIVITY MAP

Most Prospective Basins

- NW Palawan Basin
- 2. SW Palawan Basin
- 3. Sulu Sea Basin
- 4. Cagayan Basin
- 5. Visayan Basin
- Central Luzon Basin
- 7. Mindoro-Cuyo Platform

Prospective Basins

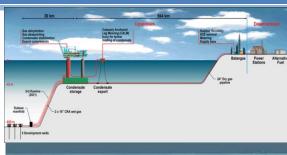
- East Palawan Basin
- 2. Reed Bank Basin
- 3. SE Luzon Basin
- 4. Agusan-Davao Basin
- Cotabato Basin

Frontier Basins

- West Luzon Basin
- West Masbate-Iloilo Basin
- 3. Ilocos Basin
- 4. Bicol Shelf Basin

- In the short term, there are not sufficient resources from Malampaya or other potential developments to justify new infrastructure development
- New gas might come from domestic resources, but the volumes and timing are unpredictable
- The only sure source of new gas in the medium term (through 2020) would be imported liquefied natural gas (LNG) to ensure supply security and sustainability of natural gas
- The Philippines today cannot access the LNG market: there are no existing or operational import facilities
- Much cheaper than oil, competitive with coal in the mid-cycle, and once import facilities are built, industrial, commercial, and transportation users can also gain access to gas

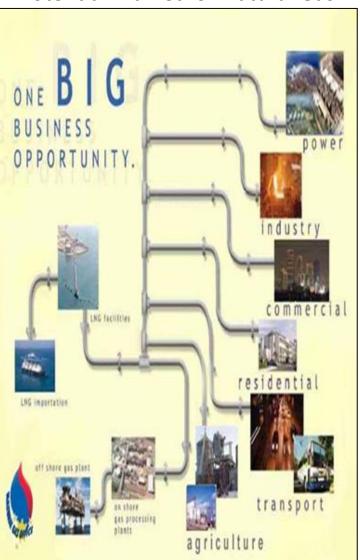
The commercialization challenge: develop a market for LNG that can justify the investment in the LNG importation facilities



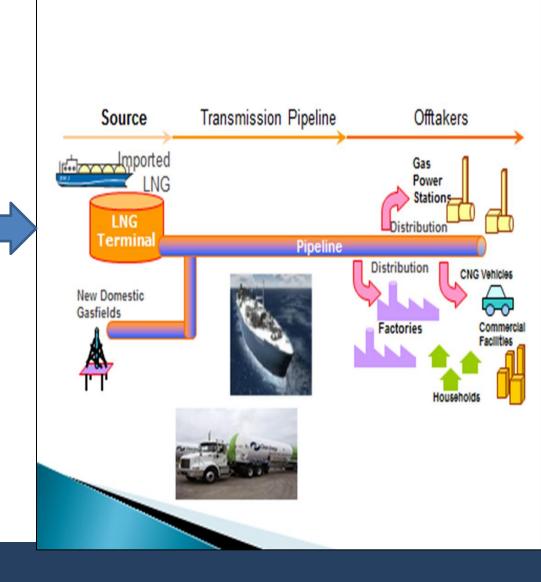




Potential Market for Natural Gas



Strategic Infrastructure in Luzon



Integrated LNG Terminal



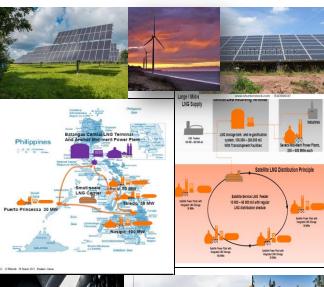
Project Cost: PHP 100 billion Targeted Completion: 2020

- Safeguard against the anticipated depletion of the Malampaya gas facility in 2024.
- Initial 200-MW
 power plant,
 storage facilities,
 liquefaction and
 regasification units.
- Output will serve PEZA areas.

Opportunities for Investment

- Provides the natural gas requirement of the existing
 3,427 MW gas fired plants when Malampaya runs down
- The Philippines will need 43,765 MW by 2040, 14,500
 MW will be for mid-merit and 4,000 MW for peaking
- RE capacity is poised to increased from its 2010 level of 5,000 MW to 2030 level of 15,000 MW, due its intermittent nature, natural gas fired power plants can complement when these plants will not be running
- Additional potential demand of LNG will come from the off-grid or missionary islands by replacing the existing diesel-fired power plants with natural gas.
- LNG will primarily be consumed in the power sector, but will soon cover non-power applications such as in the industrial processes, transportation, commercial and residential sectors





Development Initiatives

- Natural Gas Quality Standard
- Creation of Inter-Agency Health, Safety, Security Environment (HSSE) Inspection Team
- Organized the Natural Gas Coalition Group
- Ongoing drafting of the LNG Department Circular











Challenges in the Development Plans

- Limited supply of Natural Gas
- Power generation sector remains to be the main driver to natural gas industry development
- Lack of Available Natural Gas Infrastructure Network
- Absence of Natural Gas Law
- Lack of Gas Related Policy and Legislative framework
- Shortcomings of current Regulatory framework
- Lack of Locally Industry Standards
- Capacity build-up for the DOE and the natural gas industry







Thank You!

