The Development Plans for an Emerging Philippine Downstream Natural Gas Industry

E-Power Mo: Empowering Filipinos through Informed Energy Plans and Policies

Grand Xing Imperial Hotel H. Montinola cor. Muelle Loney St., Iloilo City
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Natural Gas Management Division
Oil Industry Management Bureau
Department of Energy

Overview of the Natural Gas Industry

414 MW San Gabriel
First Gen/ IPP

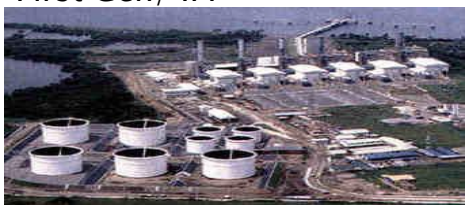
Shell Refinery

Malampaya Gas Field
2.7 TCF (2001)

Libertad Gas Field 0.6
BCF (2012)

1MW DESCO
(Onsite/Mine mouth
Power Plant)

97 MW Avion
First Gen/ IPP



560 MW San Lorenzo
First Gen/ IPP

1,000 MW Sta. Rita
First Gen/ IPP

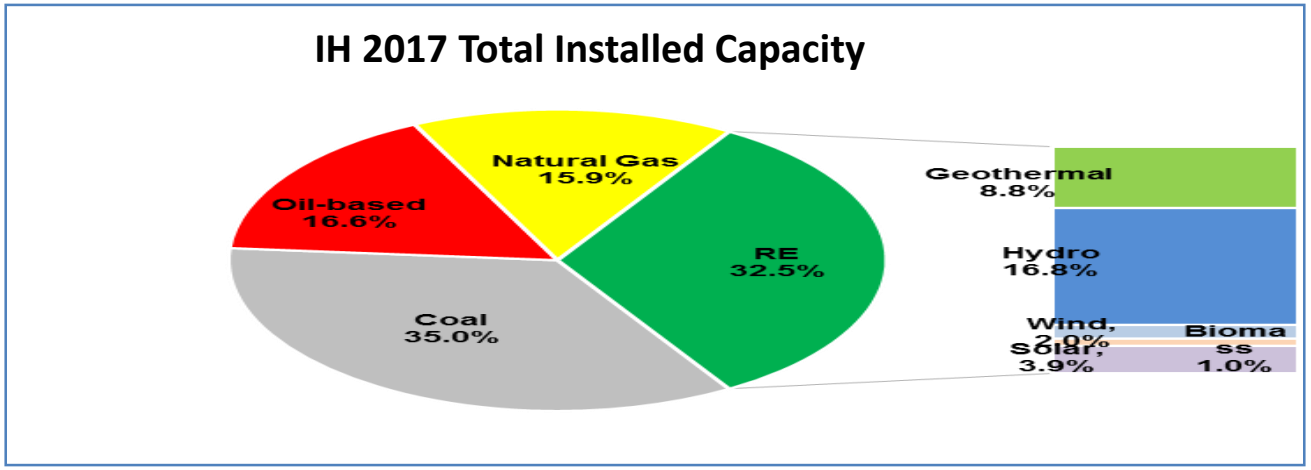
1,200 MW Ilijan Power Plant
NPC IPP(KEPCO)

CNG Bus (2008)

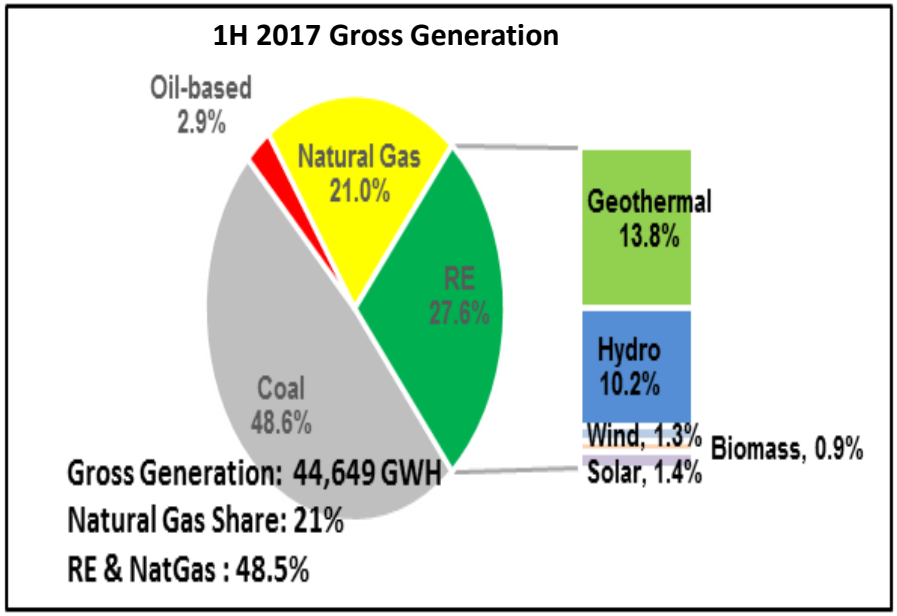
BRIGHT NOW!
DO RIGHT. BE BRIGHT.

Current Status of the Natural Gas Industry

Total Installed Capacity:	21,621 MW
Renewable Energy Share:	32.5%



- Aggregate capacity of natural gas power plants is 3,200 MW, in 1H 2017 the share of natural gas in the installed capacity is 15.9 percent
- The share of natural in 1H 2017 the share is 21 percent . The residential sector is the biggest consumer of electricity followed by the industrial and commercial sectors.



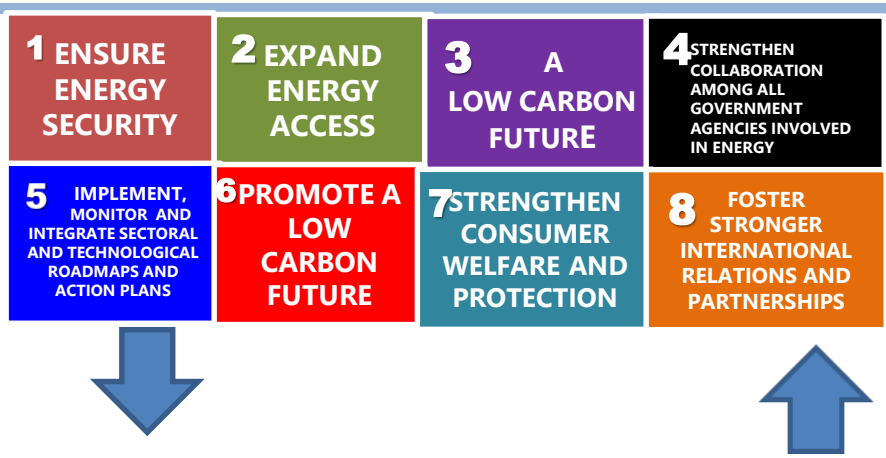
Policy Thrust/Directions

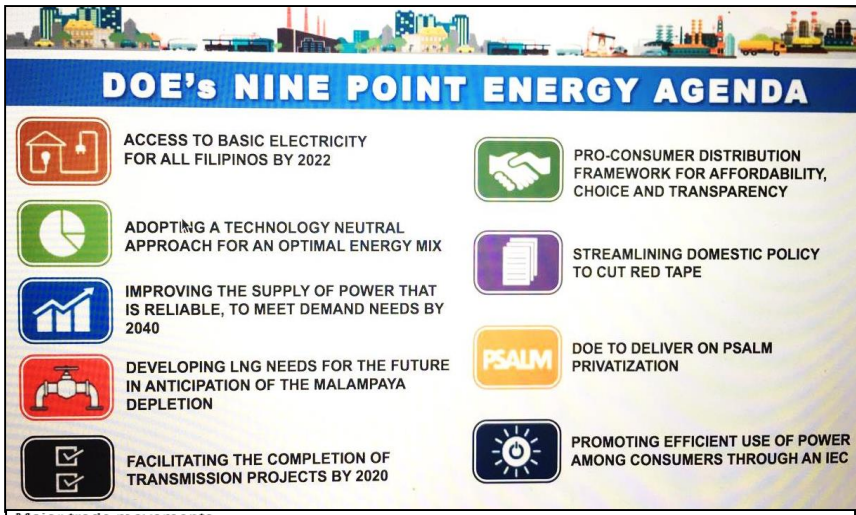
- The plans and programs for the downstream natural gas industry are anchored to the energy sector strategic directions which are aligned with the Administration's vision of inclusive growth, high trust society and a competitive knowledge economy

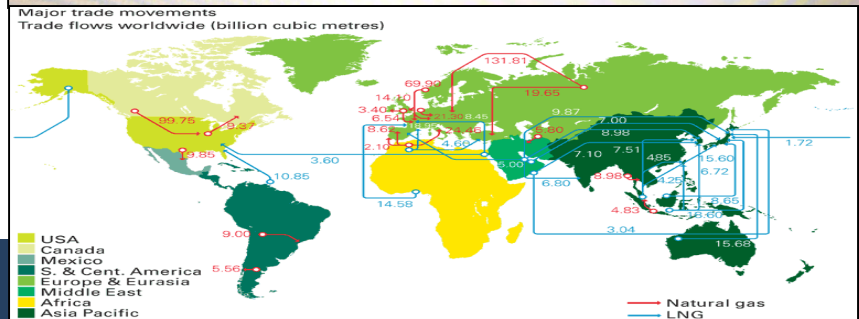
- Natural gas also contributes to the goals of the government towards achieving energy security, sustainable development and improve access to clean energy

- To ensure the continuity of power supply from natural gas-fired power plants to anticipate the eventual depletion of the Malampaya gas field by 2024, an integrated LNG receiving and distributing facility with a reserve initial power plant capacity of 200 MW will be constructed.

- The Philippine is strategically located in the major trade movements, it envisioned to be the LNG market/trading and trans-shipment hub in the Asia-Pacific region.







Development Strategy

Development Strategy

- Passage of Executive Order 30
  - **provides for energy projects amounting to at least US$70 million to be classified as projects of national significance**
  - **mandate the streamlining of permitting process of all government agencies under the Energy Investment Coordinating Council (EICC) to act on proposal within 30 days, otherwise, the proposal is deemed approved.**
- Issuance of the “Rules and Regulations Governing the Philippine Natural Gas
  - provide a transparent guidelines for investors.
  - provide the creation of liberalize markets and entry of investment through TPA
    - ✓ usher in the development of the natural gas industry
    - ✓ transform the Philippines as the liquefied natural gas (LNG) trading and trans-shipment hub in the Asia-Pacific Region

PNG Circular

Permitting

a. **Natural Gas Facilities**

1) **Notice to proceed (NTP)**
2) **Permit to Construct, Expand, Rehabilitate and Modify (PCERM)**
3) **Permit to Operate and Maintain (POM)**

b. **Supply**

1) **Acknowledgment to Import**
2) **Acknowledgment to Supply and Transport**

Development Plans and Programs

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**

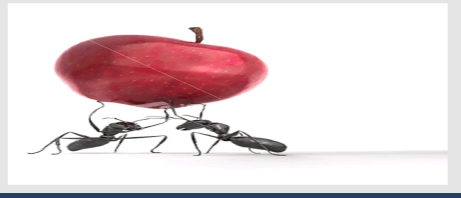
  - that will efficiently deliver gas to the demand centers

- **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 Gas as the Only Source of Natural Gas Supply

- **Malampaya has existing six gas sales and purchase agreements for a total of 3, 200 MW**
  - 500 MW San Lorenzo PP (First Gen)
  - 1000 MW Sta Rita PP (First Gen)
  - 1200 MW Ilijan PP (KEPCO)
  - 414 MW San Gabriel (First Gen)
  - 97 MW Avion (First Gen)
  - 18 MW Shell Pilipinas Oil Refinery

- **Malampaya has an average production of 450 million standard cubic feet (mmscf) per day**

- **The Malampaya concession expires in 2024 and Drop in supply is expected to start by 2022, supply can go as far as 2027 but it does not have enough gas for further expansion 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.**

- **Thus:**

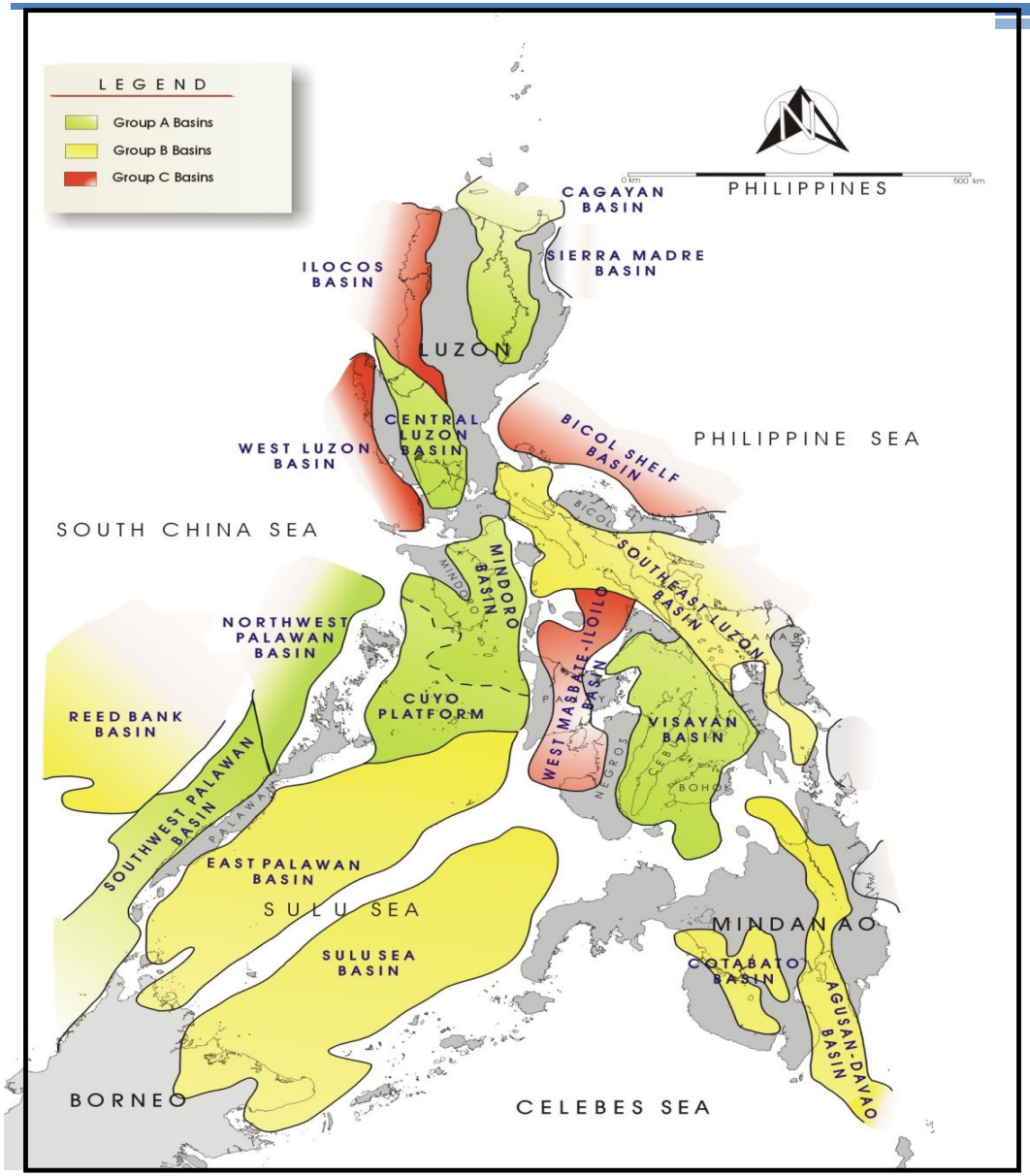
- **In the short term, Philippines has no sufficient supply from Malampaya or other potential developments to justify new infrastructure development.**

- **New gas might come from domestic resources, but the volumes and timing are unpredictable.**

- **The logical source of new gas would be the imported liquefied natural gas (LNG) to ensure supply security and sustainability of natural gas**

- **Much cheaper than oil, competitive with coal in the mid-cycle, and once import facilities are built, industrial, commercial, transportation and residential users can also gain access to gas**

Development Plans and Programs



PETROLEUM BASIN PROSPECTIVITY MAP

Most Prospective Basins

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

Prospective Basins

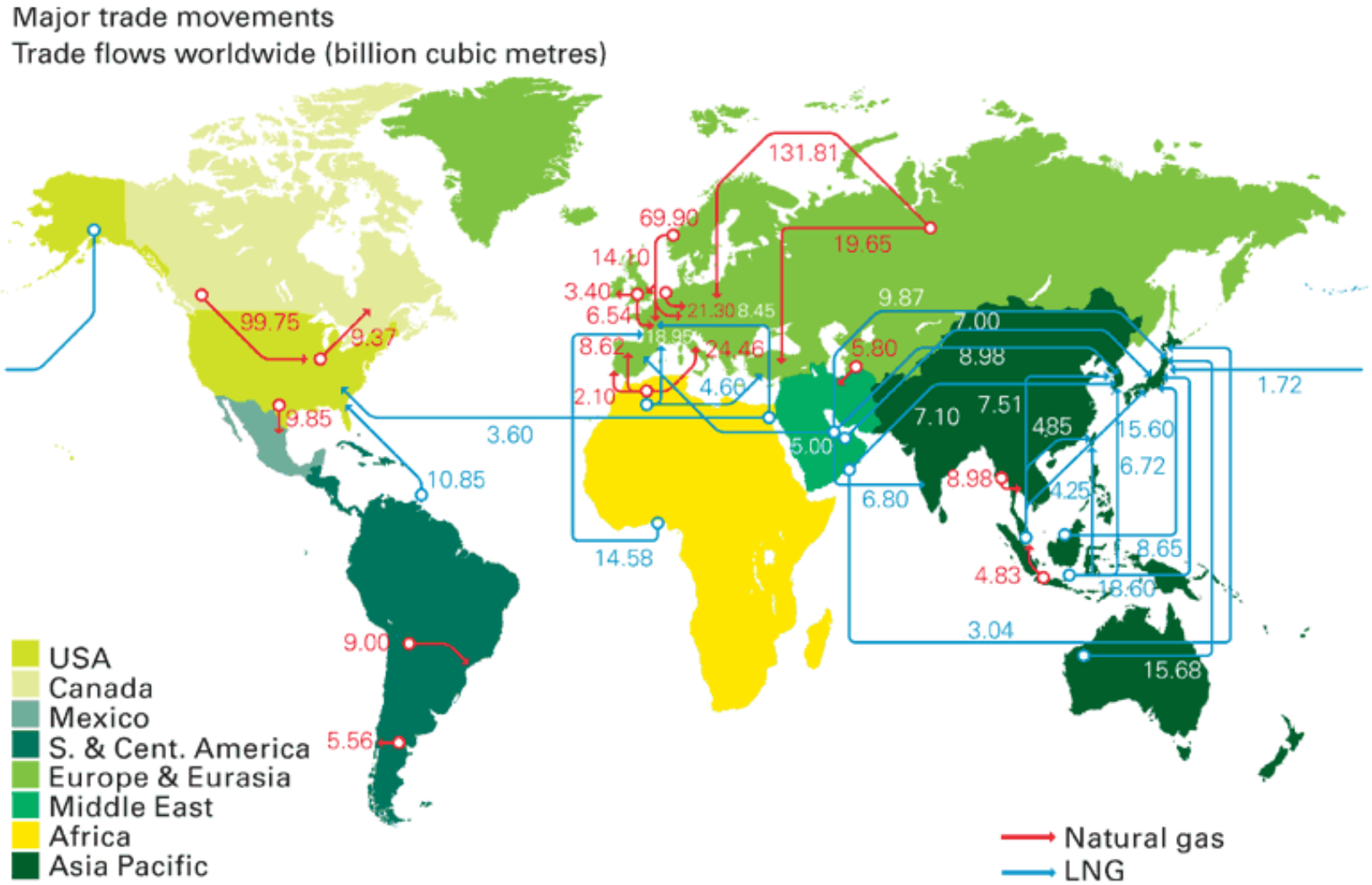
1. East Palawan Basin
2. Reed Bank Basin
3. SE Luzon Basin
4. Agusan-Davao Basin
5. Cotabato Basin

Frontier Basins

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

Development Plans and Programs

Access to Imported Liquefied Natural Gas

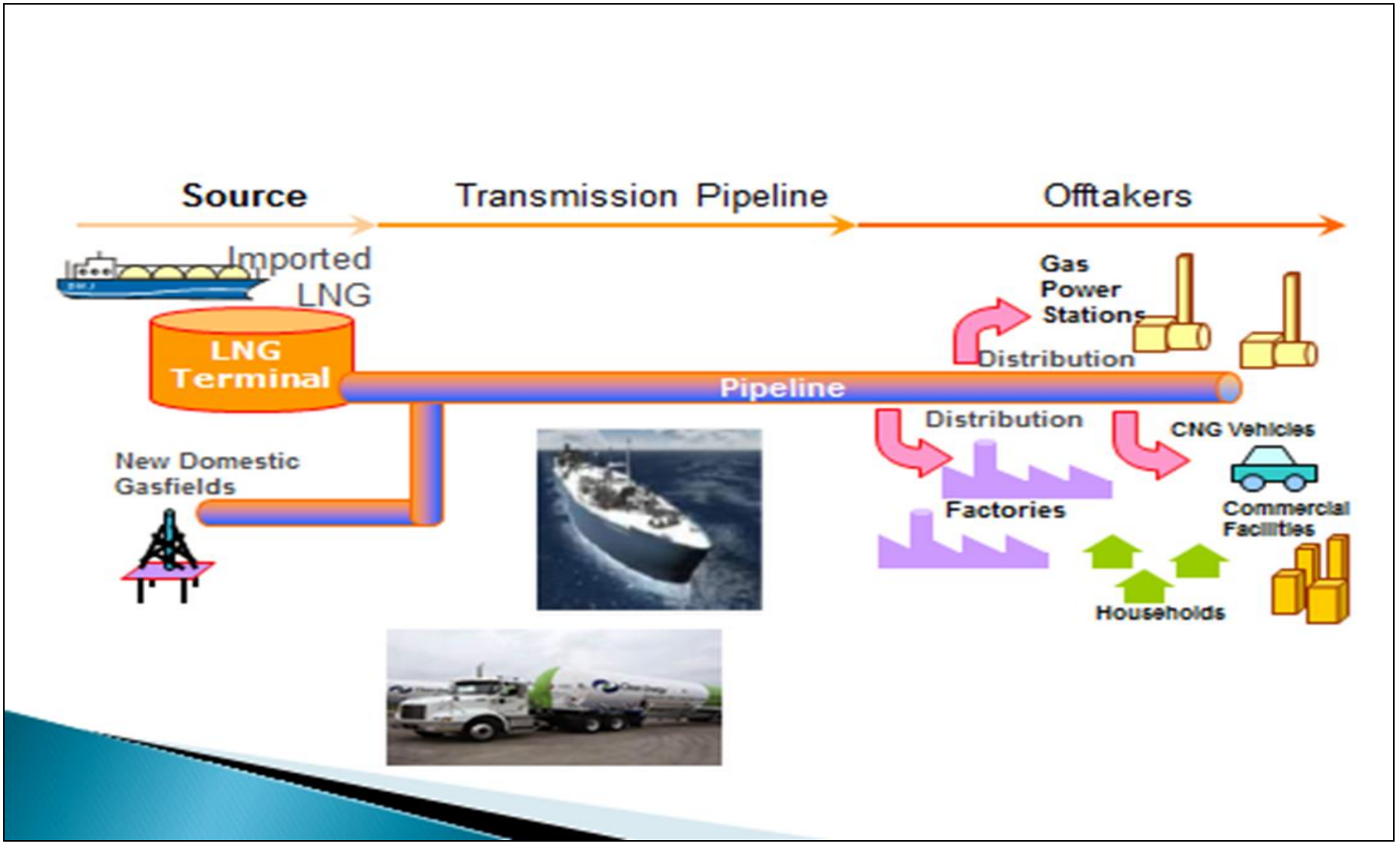


The Philippines sits in the middle of Asian LNG Trade

Source: BP Statistical Review 2007

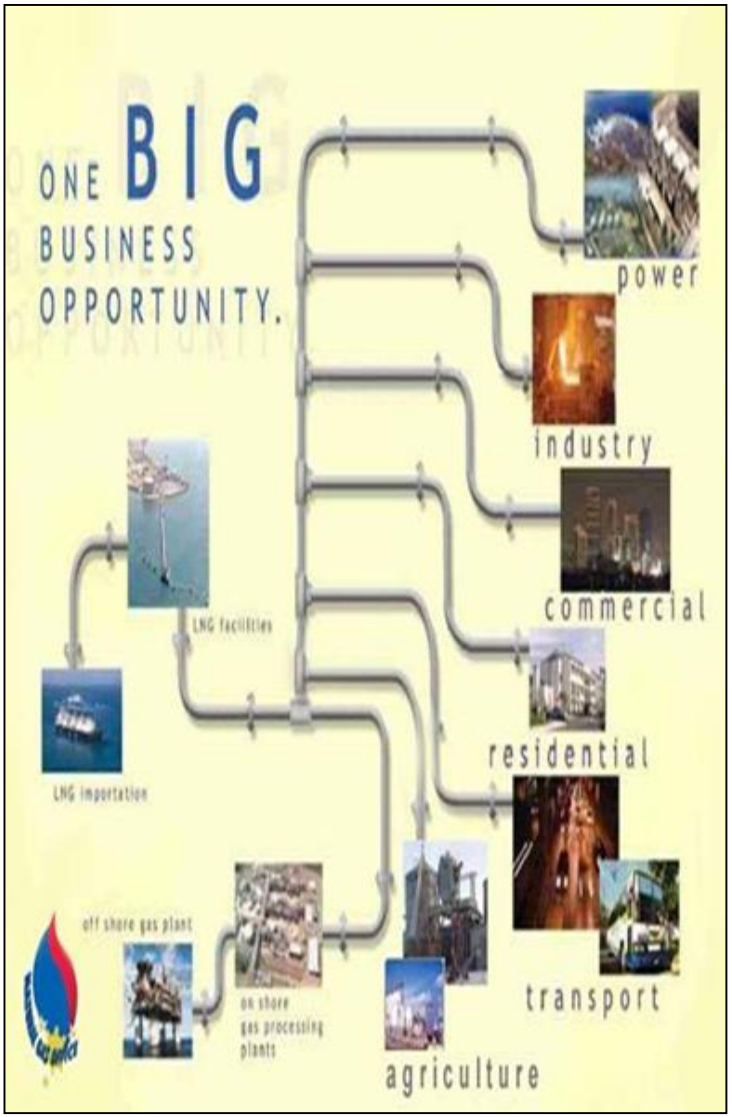
Development Plans and Programs

Strategic Infrastructure in Luzon

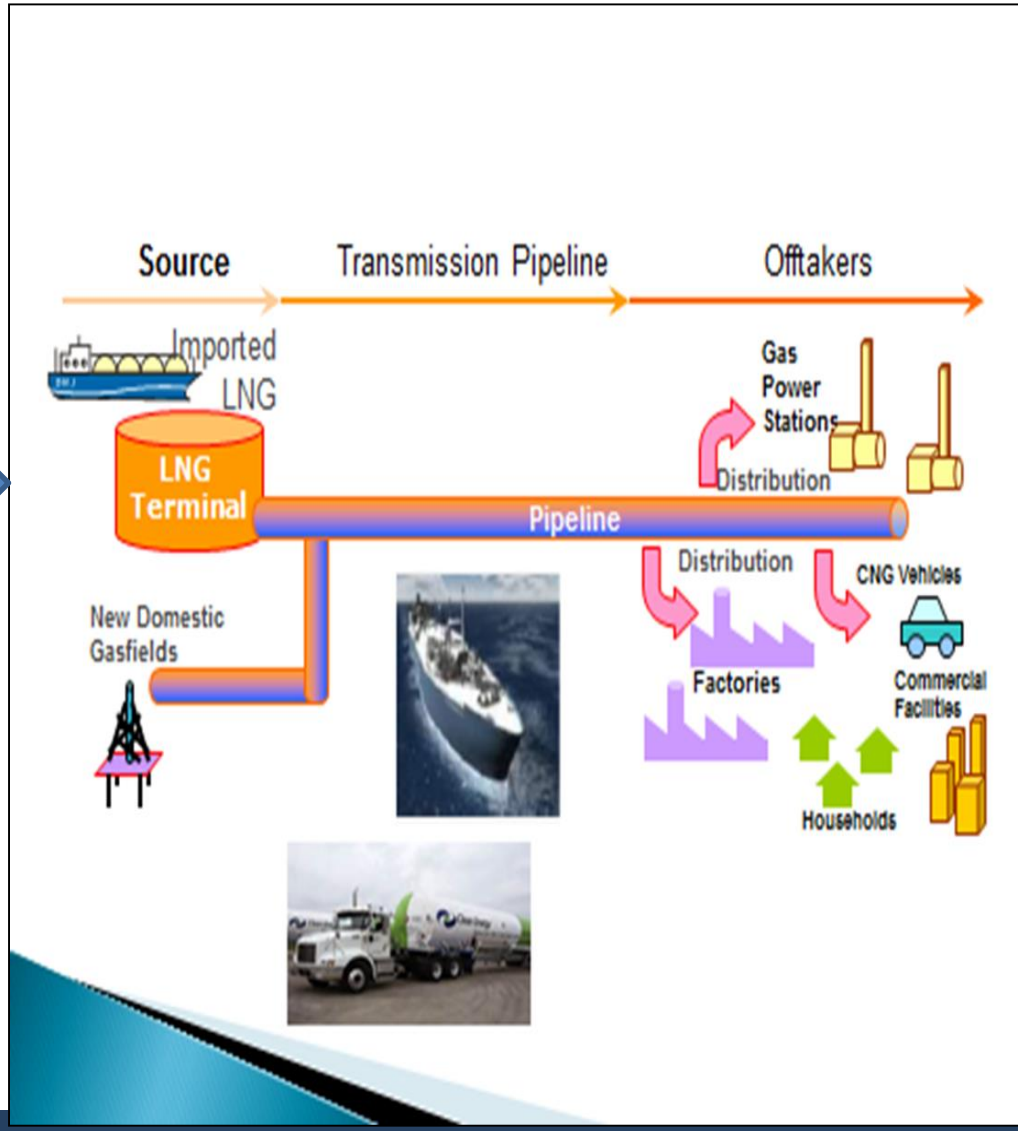


Development Plans and Programs

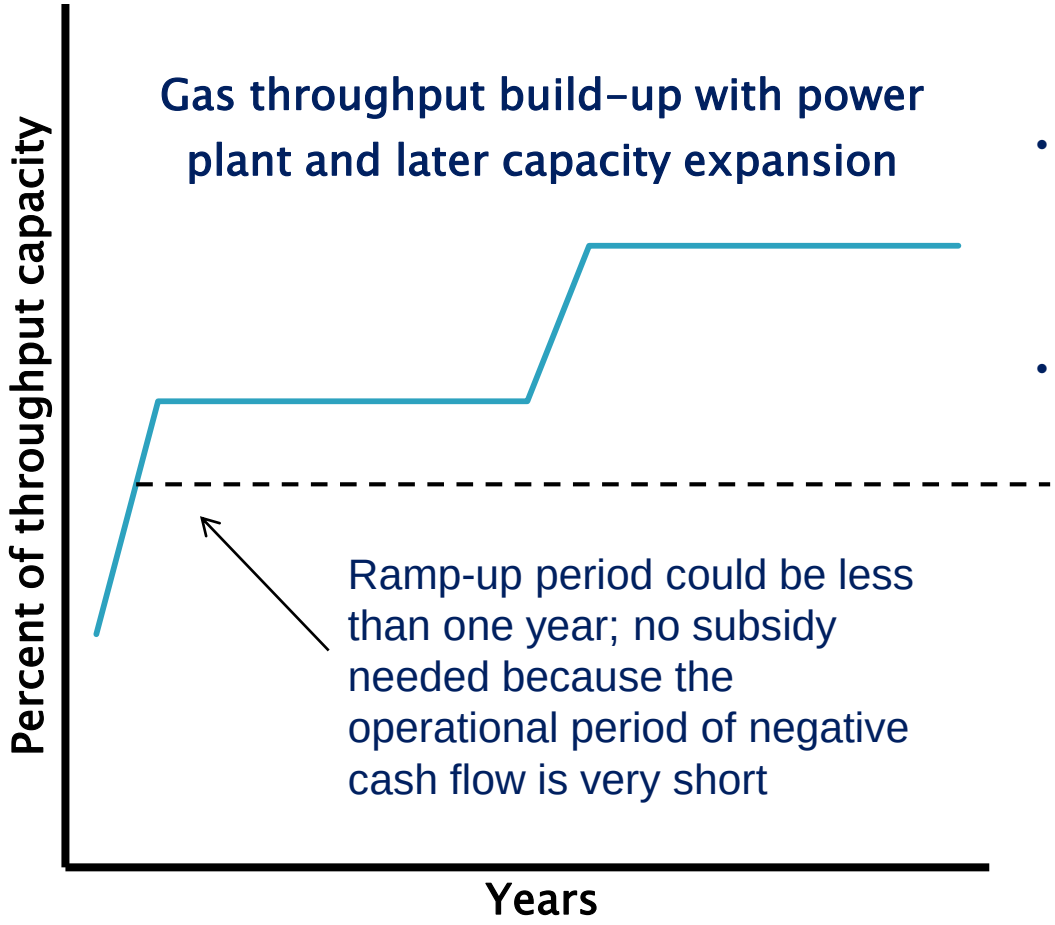
Potential Market for Natural Gas



Strategic Infrastructure in Luzon



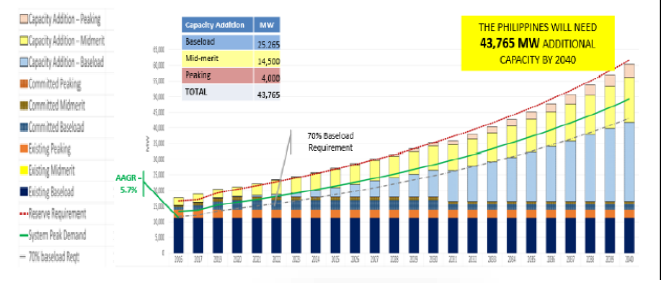
Power plants are typically ideal anchor loads

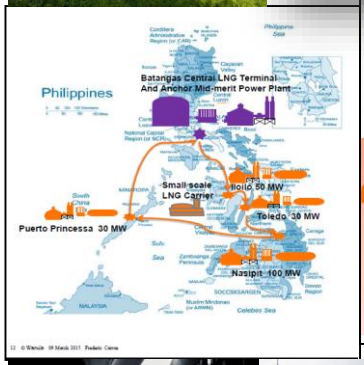


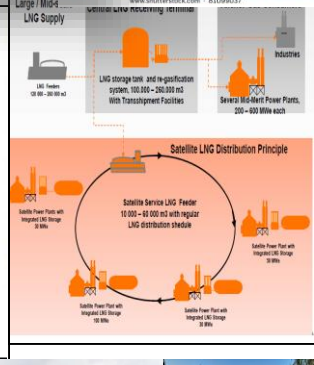
- **Power generation capacity can come on-line when the gas infrastructure is complete**
- **Cross-indemnification: liquidated damages if either party does not complete infrastructure on time (if project is not fully integrated)**

Opportunities for Investment

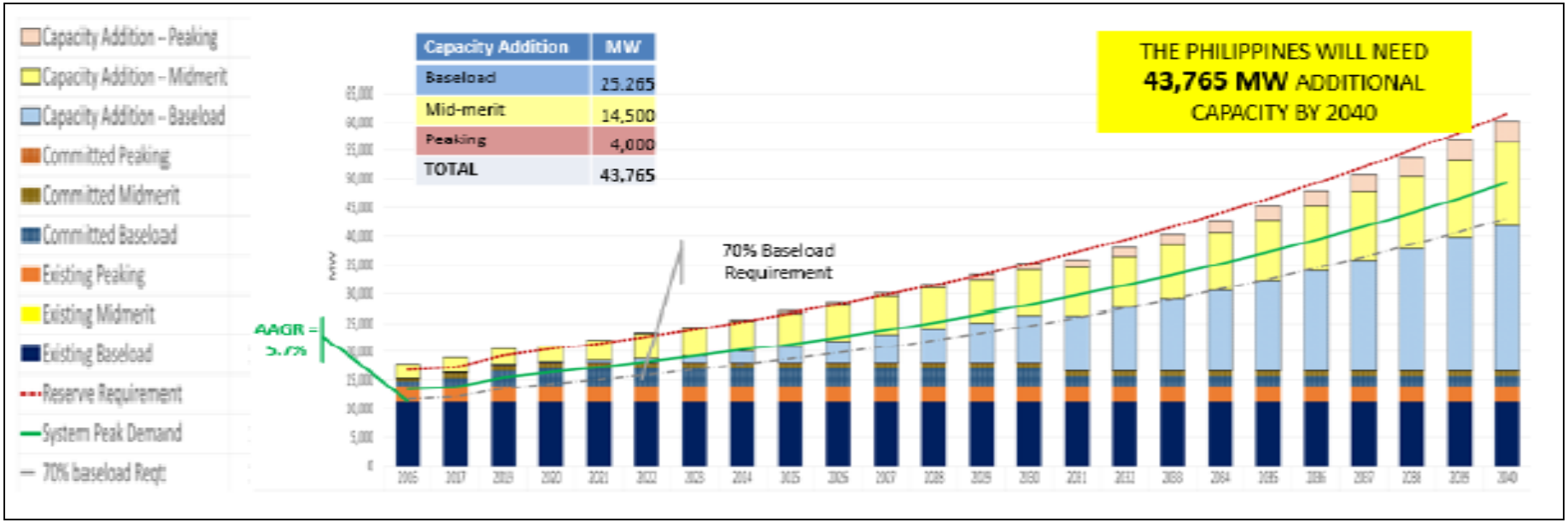
- Provides the natural gas requirement of the existing 3,427 MW gas fired plants when Malampaya runs down
- The Philippines will need 43,765 MW by 2040, 14,500 MW will be for mid-merit and 4,000 MW for peaking
- RE capacity is poised to increased from its 2010 level of 5,000 MW to 2030 level of 15,000 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







Additional Power Capacities
2017 to 2040



In pursuit of a policy that aims to develop technology-neutral energy sources in meeting the ideal proportion of 70%-baseload, 20%-mid-merit and 10%-peaking requirements for power generation.

Capacity Addition, in MW	Luzon	Visayas	Mindanao	Total by Type
Baseload (Coal, Geothermal, NatGas*, Nuclear, Biomass* and Hydro*)	13,635	5,330	6,300	**25,265**
Mid-merit (NatGas 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**

Note: At 70-20-10 Baseload, Mid-merit, Peaking Requirement
*NatGas 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 subject to availability

Department of Energy
5 December 2016

The government is determined to achieve the ideal and dependable 70-20-10 energy mix, through massive infrastructure development with the indispensable participation of the private sector

Thank You !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