Chapter III. CONVENTIONAL FUELS

Harnessing indigenous energy resource is one of the government's priority thrusts to ensure economic progress. With the rapidly-increasing energy demand in the country, the Department of Energy (DOE) will intensify the exploration and development of fossil fuels to achieve energy self-sufficiency and provide Filipinos with stable supply.

OIL AND GAS

The DOE continues to boost investment opportunities in the upstream oil and gas sector, especially with the impending depletion of the Malampaya[27] gas field in the near future.

The global trend points towards the use of cleaner energy sources such as renewables. However, the promotion of an optimal energy mix utilizing all available energy sources is pivotal to boost economic development. This view is supported by the World Economic Forum[28] noting that approximately 31.0 percent of primary energy used globally are oil-based fuels while natural gas represents 21.0 percent of the total world energy supply.

The country has vast resource potential and plays host to 16 sedimentary basins covering an area of more than 700,000 sq. kms. and a combined potential of 4,777 MMBOE of oil and gas reserves (*Figure 38*).

Figure 38. SEDIMENTARY BASINS IN THE PHILIPPINES

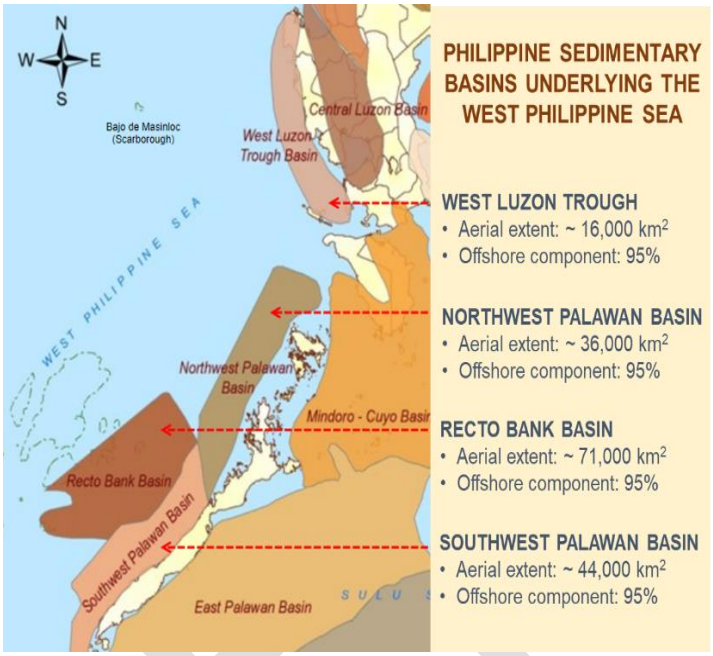
27 The Malampaya Deep Water Gas to Power Project of Shell Philippines Exploration B.V. has been the country's major source of natural gas since 2001. The consortium's SC 38 contract will expire by 2024.

28 Source: Global Agenda Council on the Future of Oil and Gas by the World Economic Forum published in April 2016

These basins are: (1) Ilocos Shelf; (2) Cagayan; (3) Central Luzon; (4) Bicol Shelf; (5) Southeast Luzon; (6) Mindoro-Cuyo; (7) West Masbate-Iloilo; (8) Visayan; (9) Agusan-Davao; (10) Cotabato; (11) Sulu Sea; (12) East Palawan; (13) Southwest Palawan; (14) Reed Bank; (15) Northwest Palawan; and (16) West Luzon Trough. The sedimentary fill ranges from 1 km. (Northwest Leyte sub-basin of the Visayan Basin) to as thick as 15 kms. (southern part of the Sulu Sea Basin).

As shown on *Figure 39*, four (4) sedimentary basins with total aerial extent of 167,000 sq. kms. are underlying the West Philippine Sea (West Luzon Trough, Northwest Palawan, Recto Bank and Southwest Palawan).

Figure 39. SEDIMENTARY BASINS IN THE WEST PHILIPPINE SEA



A. ASSESSMENT

To maximize the exploration and development of indigenous petroleum and coal resources, Department Circular (DC) No. 2017-09-0010 introducing the *"Philippine Conventional Energy Contracting Program (PCECP)"* was issued on 13 September 2017. The PCECP is a new contracting scheme for coal and petroleum exploration wherein two (2) modes of awarding Service Contract (SC) is envisioned. The first mode is through the nomination process which enables investors to apply for service/operating contracts anywhere in the country at any given time, while the other mode is through application in Pre-Determined Areas (PDAs) previously identified/delineated by the DOE.

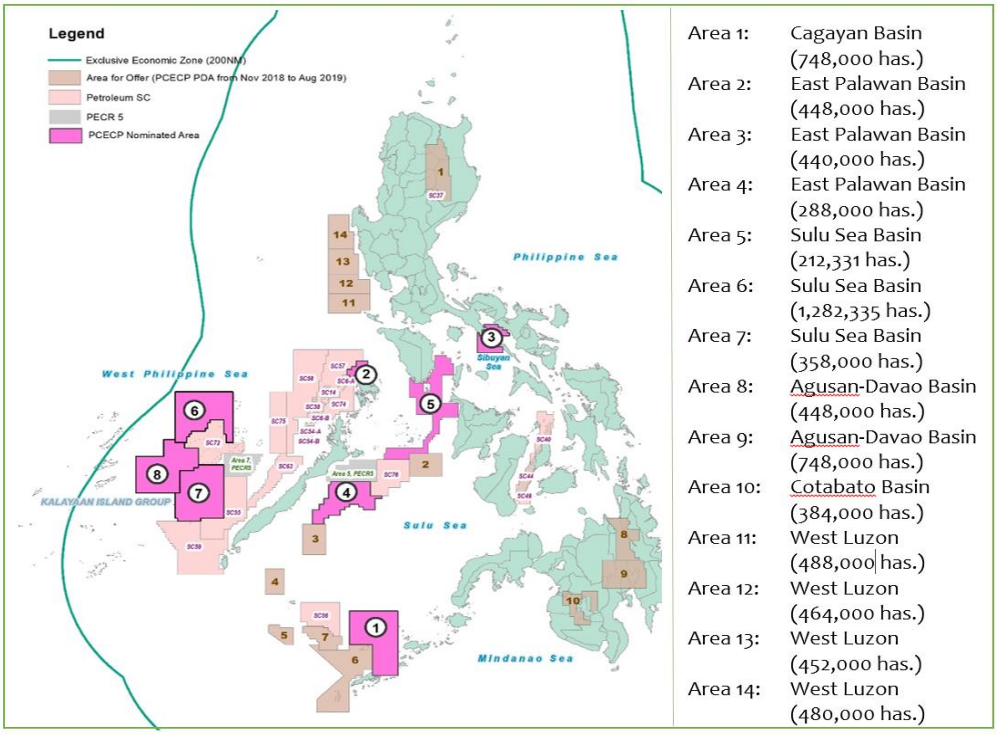
A series of local and international roadshows on the PCECP were conducted during the last quarter of 2018 and first half of 2019 in the Cities of Puerto Princesa, Davao and Zamboanga, as well as in Singapore, Cape Town (South Africa) and Texas (USA). On the other hand, the 180-day application period[39] for the 14 pre-determined areas for offer started during the Program's

"The DOE is aggressively pursuing the implementation of the PCECP so the country could establish a strong 'Explore, Explore, Explore' program." Secretary Alfonso G. Cusi during the launching of the PCECP

[39] As of December 2019, a total of two (2) applications – one in Area Nomination and one in Pre-Determined Area – with total investment cost of almost US$50 million are recommended for awarding to the Office of the President.

launching ceremony held on 22 November 2018 at the Shangri-la at the Fort in Taguig City. The 14 pre-determined areas are listed in *Figure 40*.

Figure 40. AREAS FOR OFFER UNDER THE PCECP



As of 2019, the DOE monitored and supervised the operation of 20 active SCs (*Figure 41*). Philippine National Oil Company Exploration Corporation (PNOC EC), an attached agency of the DOE involved in the exploration, development and production of petroleum and coal in the country, currently operates three (3) contracts. It covers a total area of 25,630 square kms. and located in Isabela (SC 37), Calamian Block in Northwest Palawan (SC 57) and Southwest Palawan (SC 59).

Figure 41. ACTIVE SERVICE CONTRACTS IN THE PHILIPPINES

SC#	OPERATOR	LOCATION
6A	• The Philodrill Corp.	• Offshore NW Palawan
6B	• The Philodrill Corp. (Bonita)	• Offshore NW Palawan
14	• The Philodrill Corp. (Blocks A, B, B1, D, Tara) • Galoc Production Company (Galoc) • The Philodrill Corp. (Block 14C – 2 West Linapacan)	• Offshore NW Palawan • Offshore NW Palawan • Offshore NW Palawan
37	• PNOC EC (Cagayan Basin Exploration)	• Quirino, Isabela
38	• Shell Philippines Exploration B.V. (from GSEC 47)	• Offshore NW Palawan
40	• Forum Exploration, Inc.	• Onshore/Offshore North Cebu
44	• Gas2Grid (G2G) Ltd.	• Central Cebu
49	• China International Mining Petroleum Company	• Onshore/Offshore South Cebu
53	• Mindoro-Palawan Oil and Gas, Inc.	• Onshore/Offshore Mindoro
54	• Nido Petroleum Phils. Pty. Ltd (54A, 54B)	• Offshore NW Palawan
55	• Palawan 55 Exploration and Production, Inc.	• Offshore SW Palawan
56	• Total E & P Phils. BV	• Sulu Sea
57	• PNOC EC (Calamian)	• Calamian Block, Offshore NW Palawan
58	• Nido Petroleum Phils. Pty. Ltd	• West Calamian Block, NW Palawan
59	• PNOC EC	• West Balabac, Offshore SW Palawan
63	• Nido Petroleum Phils. Pty. Ltd	• Offshore SW Palawan
72	• Forum (GSEC 101) Ltd.	• Offshore NW Palawan
74	• PXP Energy Corp.	• Offshore NW Palawan
75	• PXP Corporation	• Offshore NW Palawan
76	• Ratio Petroleum Ltd.	• Offshore East Palawan

During the period of 2017 until 2018, petroleum production reached 2.9 million barrels (MMB) of oil, 289.3 billion cubic feet (BCF) of gas and about 8.0 MMB of associated condensate. Currently, oil production in the country is mainly sourced from Galoc, Nido, Matinloc, North Matinloc and Alegria fields.

The newest oil field discovery located in Alegria, Cebu was inaugurated by President Rodrigo R. Duterte on 19 May 2018. Under SC 49, its operator, China International Mining Petroleum Company Limited (CIMP), discovered about 27.9 MMB of oil with a possible production recovery of 3.4 MMB. The field also has natural gas reserves of 9.4 BCF with estimated recoverable resource of 6.6 BCF which could fuel power plants connected to the local power grid. This oil field is expected to contribute significantly to the country's energy supply needs.

Energy Secretary Alfonso G. Cusi discusses the specifics of the Alegria oil field with Guests of Honor, President Rodrigo R. Duterte and Senator Christopher Lawrence "Bong" Go, during the launching of the new oil field located in Cebu. Said oil field has the distinction of being the country's first onshore discovery.

Another major accomplishment of the sector is the President's signing of SC 76 in Eastern Palawan on 17 October 2018, the first SC signed under the Duterte administration. The Ratio Petroleum Ltd. (proponent of SC 76) will conduct exploration activities covering the Area 4 in East Palawan Basin for potential energy resources. The area covers 416,000 hectares (has.) with minimum total expenditure valued at US$ 34.4 million.

B. PLANS AND PROGRAMS

To achieve the overall objectives of the upstream oil and gas sector by 2040, the DOE identified several targets to include the drilling of additional oil and gas fields during the planning horizon *(Figure 42)*.

Part of the sector's action plan to accomplish these targets are to formulate and implement policy issuances on upstream petroleum sector to streamline petroleum related activities of SC Operators/Holders as well as resolve the issues on West Philippine Sea to resume the exploration activities of SCs that are under Force Majeure.

1. Medium-Term

The drilling of an oil prospect in the Visayan Basin will bring in potential recoverable reserves of up to 20.0 MMB, while a total of 2.2 trillion cubic feet (TCF) of gas could be produced from the drilling of two (2) gas prospects in Northwest Palawan.

In terms of production, crude oil output is expected to reach 5.6 MMB with biggest contribution of 3.4 MMB from the Galoc field in Northwest Palawan. West Linapacan-A is likewise forecasted to provide 1.2 MMB of oil when it commences production in 2022. The marginal fields may also account for about 1.0 MMB of oil for the same period with projected production of 540,200 barrels from Polyard Area 6. Moreover, significant contribution of 413,000 barrels may be expected beginning 2021 from Octon and Cadlao.

For gas, Malampaya field will continue to supply 99.3 percent of the country's natural gas contributing 584,000 million standard cubic feet (MMSCF) out of the expected 588,331 MMSCF during the four-year period.

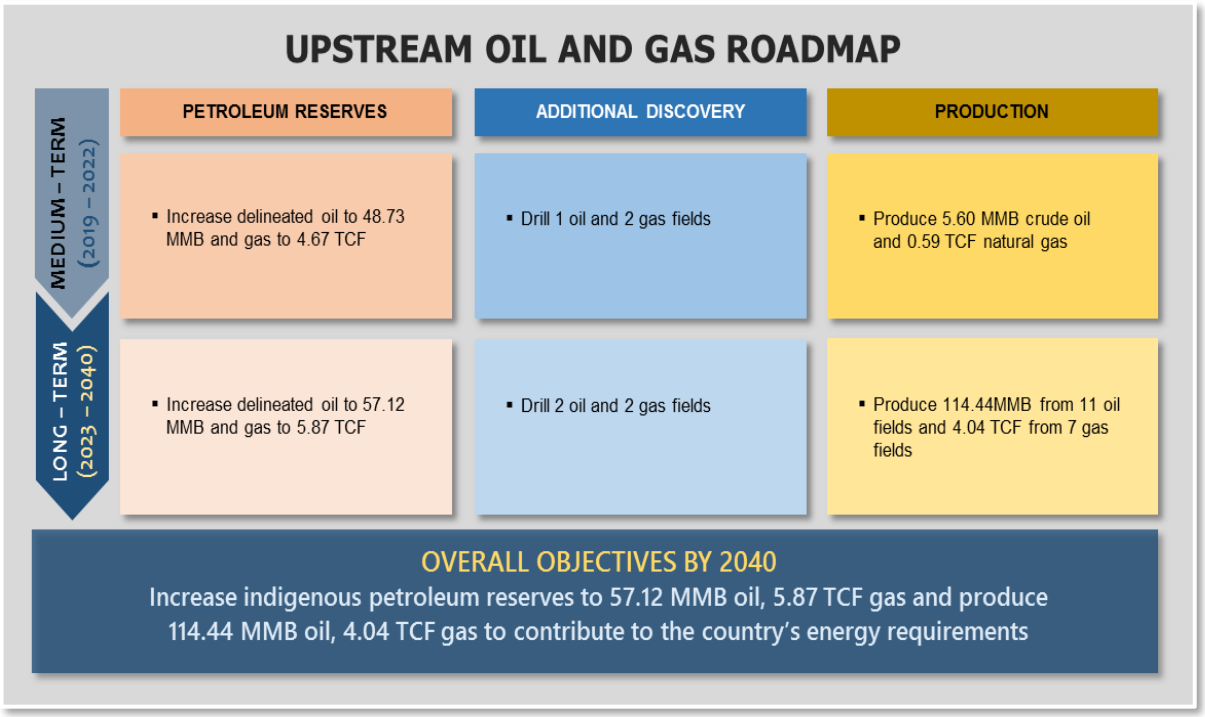
2. Long-Term

Two (2) oil prospects over the Visayan and Northwest Palawan Basins with potential recoverable reserves of 3.6 and 20.0 MMB, respectively, and two (2) gas prospects in Northwest and Southwest Palawan Basins with 3.6 TCF of reserves are targeted to be drilled between 2023 and 2040.

Oil production of 114.4 MMB is projected to come from Galoc, West Linapacan A, Camago-Malampaya oil prospects, as well as from marginal fields of Polyard Area 6, Octon, Cadlao, Linapacan, Calauit, Malolos, and two other oil prospects.

Meanwhile, gas production of 4.04 TCF is expected to come from seven (7) fields: Malampaya, San Martin, Sampaguita, Polyard A8, Mangosteen, and two (2) other gas prospects. An additional 45.9 MMB of associated condensate is also anticipated to be realized during the period.

Figure 42. UPSTREAM OIL AND GAS ROADMAP



C. INVESTMENT AND EMPLOYMENT OPPORTUNITIES

The Malampaya Deep Water Gas-to-Power project remains the largest source of natural gas in the country since the start of its commercial production in January 2002. The development which is operated by Shell Philippines Exploration B.V. (SPEX) provides about 40.0 percent of the energy supply to Luzon.

From January 2002 until June 2018, the government has already collected royalties amounting to PhP 263 billion from the Malampaya project in accordance with P.D. No. 1234 issued on 08 November 1977.

On the other hand, revenues from data and application fees generated from the nine (9) applications received by the DOE under PCECP has already reached PhP 9.3 million. Upon the President's signing of the recommended SCs, the country may expect additional income of almost US$ 50 million.

COAL

Coal is currently the most important energy source for electricity generation, accounting for approximately 36.7 percent of global electricity generation due to abundance, low cost and ability to generate base load electricity[29].

As coal proves itself to be economically-viable being one of the most reliable and affordable sources of energy, the DOE will strengthen its efforts to embrace less polluting and more efficient technologies.

The 500-MW supercritical coal-fired power plant of San Buenaventura Power Ltd. Co. in Mauban, Quezon (source: tribune.net.ph)

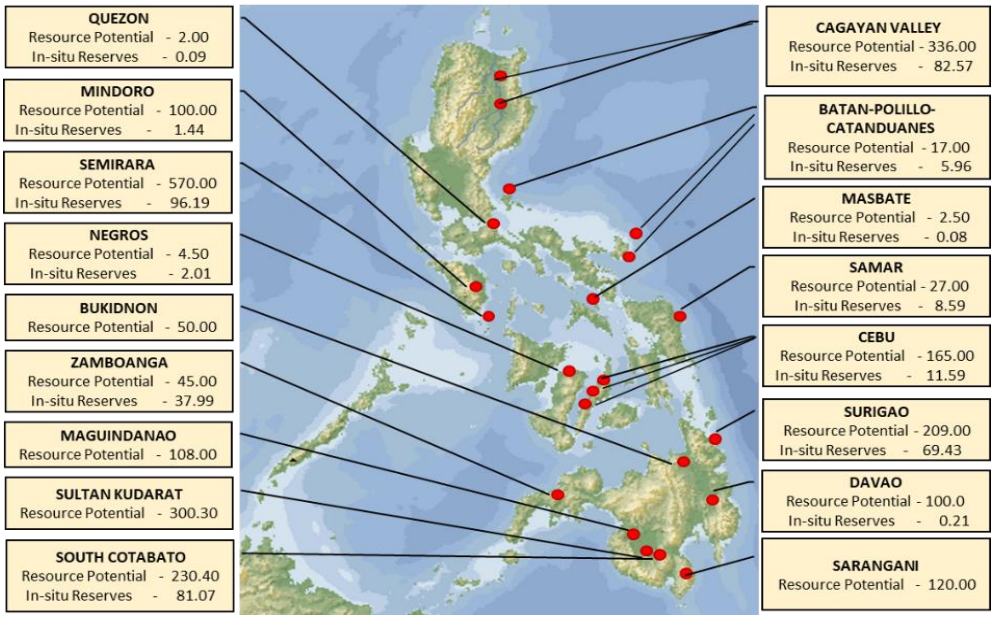
In response, the San Buenaventura Power Plant in Mauban, Quezon is set to become the first supercritical generation plant in the country using state-of-the-art emissions control technology, an electrostatic precipitator for fly-ash capture and removal, and a sea water desulfurizer to further reduce potential air pollution. The plant will begin its commercial operation in 2019.

A. ASSESSMENT

The total coal resource potential of the country stands at 2.4 billion metric tons (BMT) from the 13 coal basins all over the Philippines while in-situ coal reserves are estimated at 397 million metric tons (MMMT). The largest resource potential is in Semirara, Antique with 570 MMMT, while the smallest is in Quezon with 2.0 MMMT *(Figure 43).*

[29] International Energy Statistics, 2011

Figure 43. COAL RESOURCES IN THE PHILIPPINES



As of December 2018, the DOE continued to administer and monitor 57 existing Coal Operating Contracts (COCs) with respect to their corresponding work commitments. Of the total COCs, 31 are in the development and production stage, while the remaining 26 are in the exploration phase as shown in *Table 17*. PNOC EC currently operates four (4) coal operating contracts: COCs 41, 185 and 186 located in Zamboanga Sibugay and COC 122 in Isabela.

Table 17. LIST OF COC HOLDERS

	Name of Company	COC No.	Location	Area (Has)
Development / Production Coal Operating Contracts (COCs)				
1	Semirara Mining and Power Corporation	5	Antique	15,000
2	Adlaon Energy Development Corporation	9	Cebu	2,770
3	Ibalong Resources & Development Corporation	13	Cebu	932
4	PNOC-Exploration Corporation	41	Zamboanga Sibugay	6,000
5	Filipinas (Prefab) Systems, Inc.	68	Oriental Mindoro	8,000
6	Filipinas (Prefab) Systems, Inc.	77	Zamboanga Sibugay	1,000
7	Filipinas (Prefab) Systems, Inc.	78	Zamboanga Sibugay	4,000
8	Benguet Corporation	83	Surigao del Sur	12,000
9	A Blackstone Energy Corp.	93	Zamboanga Sibugay	1,000
10	D. M. Wenceslao and Associates, Inc.	116	Cagayan Valley	3,000
11	PNOC-Exploration Corporation	122	Isabela	9,000
12	D. M. Wenceslao and Associates, Inc.	123	Cagayan Valley	1,000
13	Lima Coal Development Corporation	125	Albay	400
14	Daguma Agro Minerals Inc.	126	South Cotabato & Sultan Kudarat	2,000
15	Smart Mining and Resources Development Corp.	127	Surigao del Sur	2,000
16	Samaju Corporation	128	Albay	1,400
17	Samaju Corporation	129	Albay	542
18	Grace Coal Mining and Development, Inc.	130	Zamboanga Sibugay	2,000
19	Forum Cebu Coal Corp.	131	Cebu	2,720
20	First Asian Resources Mining Corp.	132	Cebu	2,000
21	Sultan Energy Phil. Corp.	134	Sultan Kudarat & South Cotabato	7,000

Table 17. LIST OF COC HOLDERS

	Name of Company	COC No.	Location	Area (Has)
22	SKI Construction Group, Inc.	135	Cebu	5,946
23	Batan Coal Resources Corp.	137	Albay	1,087
24	Bonanza Energy Resources, Inc.	138	South Cotabato	8,000
25	Visayas Multi-Minerals Mining & Trading Corp.	142	Cebu	3,000
26	Great Wall Mining and Power Corporation	145	Surigao del Sur	5,000
27	Abacus Coal Exploration & Development Corp.	148	Surigao del Sur	7,000
28	IL Rey'c Coal Mining Exploration Corp.	149	Cebu	2,054
29	Guidance Management Corp.	151	Negros Occidental	3,000
30	Lima Coal Development Corp.	153	Sorsogon	3,000
31	BBB Mining and Energy Corp.	173	Cebu	4,000
EXPLORATION COC WITH APPLICATION FOR CONVERSION TO DEVELOPMENT /PRODUCTION CONTRACTS				
32	Titan Mining and Energy Corp.	159	Davao Oriental	7,000
33	3Kings Sunrise Mining Corp.	165	Cebu	3,000
34	Titan Mining and Energy Corp.	166	Zamboanga Sibugay	4,000
35	Blackgem Resources & Energy Inc.	169	Davao Oriental	6,000
36	Dell Equipment & Construction Corp.	170	Saranggani & South Cotabato	10,000
37	Cedaphil Mining Corp.	171	Cebu	3,000
38	Core 8 Mining Corp.	172	Cebu	2,000
39	Yolo Mining Resources, Inc.	176	Agusan del Sur & Davao Oriental	4,000
EXPLORATION COCS				
40	SKI Energy Resources, Inc.	136	Cebu	1,000
41	DMC-Construction Equipment Resources, Inc.	154	Sultan Kudarat	3,000
42	ASK Mining & Exploration Corp.	162	Surigao del Sur	1,000
43	BlackGem Resources and Energy, Inc.	175	Davao Oriental	9,000
44	Altura Mining Philippines, Inc.	182	Catanduanes	7,000
45	Blackstone Mineral Resources, Inc.	183	Zamboanga Sibugay	2,000
46	PNOC-Exploration Corporation	185	Zamboanga Sibugay	2,000
47	PNOC-Exploration Corporation	186	Zamboanga Sibugay	5,000
48	ALCO Steam Energy Corp.	187	Agusan del Sur	4,000
49	MEGA Philippines Inc.	188	South Cotabato, Sultan Kudarat and Sarangani	6,000
50	Semirara Mining and Power Corp.	189	Oriental Mindoro	7,000
51	South Davao Development Corp., Inc.	191	Oriental Mindoro	9,000
52	Altura Mining Philippines, Inc.	200	Albay	3,000
53	Empire Asia Mining Corp.	201	Agusan del Norte	4,000
54	Altura Mining Philippines, Inc.	202	Surigao del Sur	7,000
55	Empire Asia Mining Corp.	203	Surigao del Sur & Agusan del Sur	3,000
EXPLORATION COCS WITH APPLICATION FOR CONVERSION TO DEVELOPMENT/PRODUCTION CONTRACTS				
56	BlackGem Resources and Energy, Inc.	174	Albay	2,000
57	Empire Asia Mining Corp	192	Surigao del Sur	4,000

Total coal production in 2017 was recorded at 13.3 million metric tons (MMMT) and slightly decreased to 13.1 MMMT in 2018. Bulk of which was sourced from the Semirara Mining and Power Corporation, the largest producer of coal in the country.

As the DOE prioritizes the health and safety of all workers involved in the coal mining operations, Secretary Alfonso G. Cusi signed on 28 December 2018 DC2018-12-0028 titled *"Coal Mine Safety and Health Rules and Regulations."* The new Circular repealed the 40-year old Bureau of Energy Development Circular No. 1, otherwise known as *"Coal Mine Safety Rules and Regulations,"* issued on 03 January 1978. The new rules and regulations are more applicable to the present local coal mining conditions and are aligned with the requirements of the International Labor Organization Convention on Safety and Health in Mines (ILO C176).

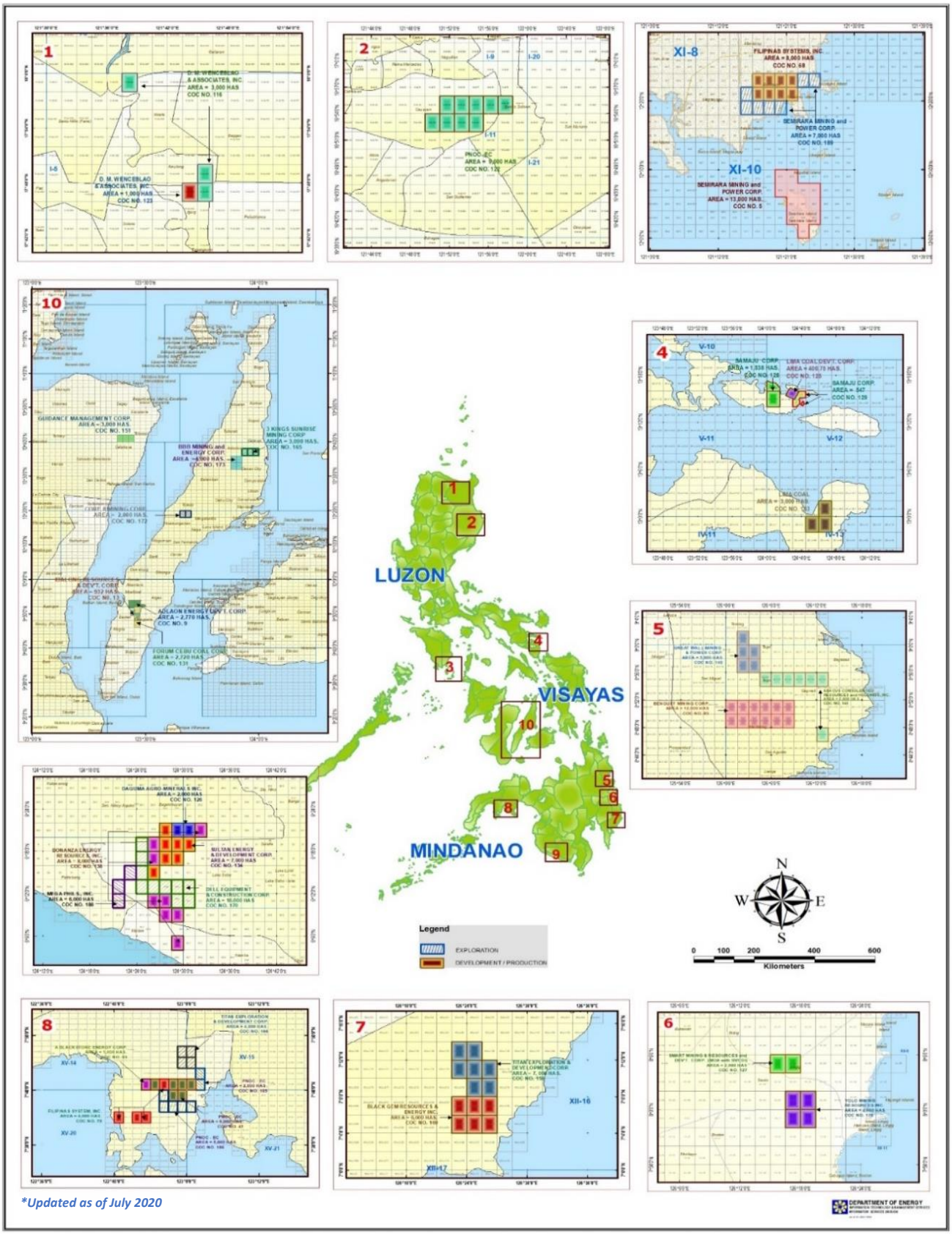
Likewise, the DOE issued DC2018-03-0006 on 15 March 2018 which aims to further streamline and simplify the processing and issuance of tax-exempt certificates, as provided under Presidential Decrees (PD) No. 87[30] and PD 972[31]. Said DC shall govern the application, processing, approval, and issuance of tax-exempt certificates for the importation, exportation, and disposal of machinery, equipment, spare parts and materials used for petroleum and coal operations.

To further strengthen DC2012-05-0006[32] signed by former DOE Secretary Jose Rene D. Almendras on 22 May 2012, the Guidelines on Coal Handling, Transport, Storage and Distribution has been drafted. It will include stricter safety/security and environmental regulation and pollution control protocols. It will also outline the compliance requirements on the different stages of coal handling, transportation and distribution, such as: (1) within COC or small-scale coal mining permit (SSCMP) area; (2) from mine stockpile to staging area or loading port; (3) by land or sea from staging area or loading port to unloading port/area; and (4) from unloading port/area to end-user/coal trader's storage facility.

Sea transport of coal via tugboat and barge

[30] Oil Exploration and Development Act of 1972
[31] Coal Development Act of 1976
[32] Guidelines on the Accreditation of Coal Traders and Registration of Coal End-Users

Figure 44. COAL OPERATING CONTRACTS IN THE PHILIPPINES



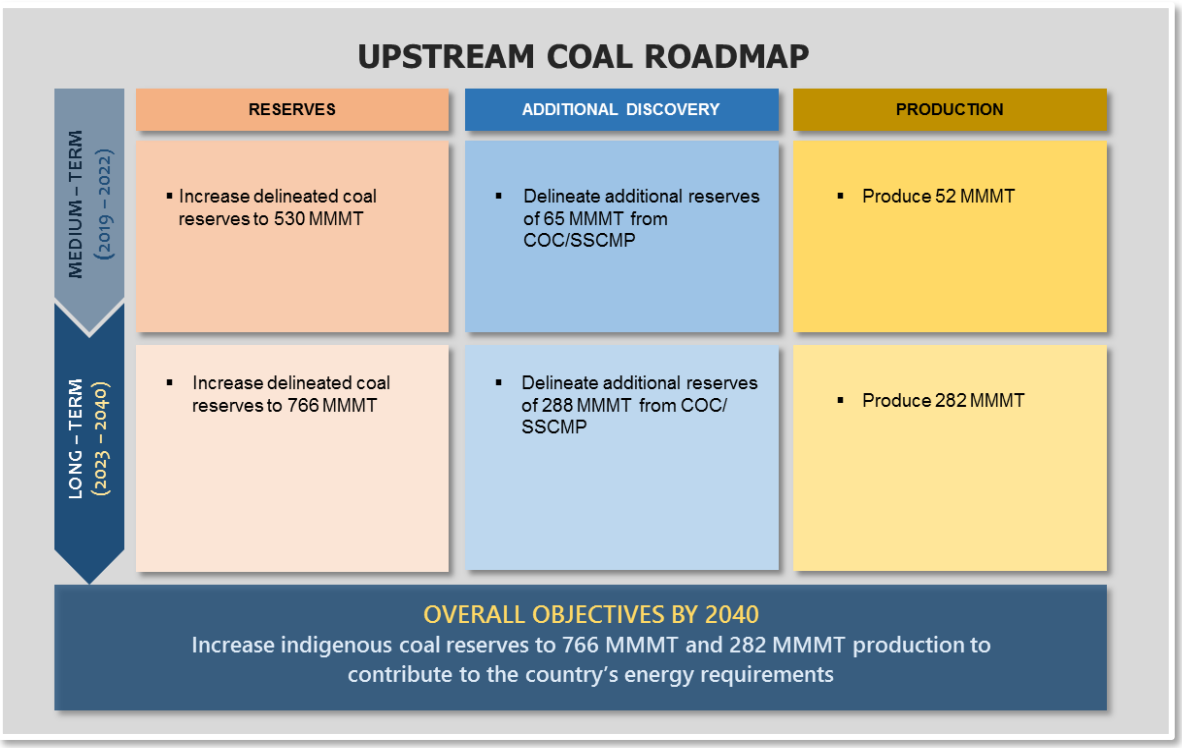
**Updated as of July 2020*

B. PLANS AND PROGRAMS

Based on the roadmap and overall objectives of the upstream coal sector, the DOE intends to increase the delineated[33] coal reserves to 530.0 MMMT and additional reserves of 65.0 MMMT from existing and new COCs and SSCMPs by 2022. For the period 2023-2040, further increases of delineated coal reserves up to 766.0 MMMT and additional reserves of 288.0 MMMT are expected from producing COCs (*Figure 45*).

In terms of production, 52.3 MMMT and 282.6 MMMT are targeted in the medium- to long-term, respectively, as the sector's targets and contribution to meet the country's energy requirements.

Figure 45. UPSTREAM COAL ROADMAP



To hurdle the challenges that may impede the realization of these targets and the fulfillment of sector's overall objectives, the DOE will put in place the following strategies:

- Attract more investors to participate in the upstream coal exploration, development and production;
- Undertake Information, Education and Communication (IEC) Campaigns to concerned/involved stakeholders/LGUs/ local community about coal and petroleum operations;
- Monitor compliance of COCs with work commitments and regulations relating to the exploration, development and production activities;
- Close coordination with other government agencies in the acquisition of necessary permits, licenses and endorsements to ensure efficient implementation and success of energy projects;
- Conduct and participate in resource assessment projects to update the current indigenous coal resources; and,
- Pursue international cooperation activities to keep abreast with the development in the industry.

[33] Determined coal reserves based on computation

C. INVESTMENT AND EMPLOYMENT OPPORTUNITIES

Pursuant to EO 10 creating the Energy Investment Coordinating Council (EICC), 10 coal projects have been certified as energy projects of national significance by the EICC (*Table 18*). These projects are expected to yield total potential investments of PhP 351 Billion. In terms of employment, these coal projects will generate more than 11,000 jobs to Filipinos.

Table 18. LIST OF COAL PROJECTS ISSUED WITH CEPNS

Proponent	Project	Capacity (MW)	Province	Investment Cost (PhP '000)
DMCI Power Corporation	Masbate Coal Plant	15	Masbate	2,295,000
DMCI Power Corporation	Palawan Coal Plant	15	Palawan	2,300,000
Atimonan One Energy, Inc.	2x600 MW Coal-Fired Power Plant Project	1,200	Quezon	150,000,000
Ozamiz Power Generation, Inc.	Coal-Fired Power Plant	300	Misamis Oriental	39,000,000
KEPCO Philippines Corporation	Pangasinan Coal-Fired Power Plant	1,000	Pangasinan	91,700,000
DMCI Power Corporation	CFB Coal-Fired Power Plant with Biomass Project (Phase 2)	15	Palawan	2,300,000
FDC Misamis Power Corporation	3x135 CFB Coal Expansion Project	405	Misamis Oriental	30,700,000
GN Power Dinginin Ltd. Co.	2x668 MW Supercritical Clean Coal-fired Power Plant	1,336	Bataan	1,700,000
Mariveles Power Corporation Corporation	Mariveles Coal-Fired Power Plant	1,200	Bataan	32,130,000
PNOC EC	Coal Operating Contract 185		Zamboanga Sibugay	52,000
PNOC EC	Coal Operating Contract 186		Zamboanga Sibugay	91,000
Total				**352,268,000**

One of the projects granted with certificate of EPNS (CEPNS) is the 1,336-MW coal-fired power project, a supercritical boiler technology, located in Mariveles, Bataan by GN Power Dinginin. The total investment of the project will reach US$ 1.7-billion and will be completed by 2020.