



TECHNICAL NOTES

2000 – 2021 Energy Asset Accounts

I. Conceptual Framework

The Energy Accounts of the Philippines is a publication that presents the physical and monetary asset accounts of the country's energy resources, namely: coal, oil, natural gas, and condensate. This is an update of the previous compilation covering the period 2000 to 2020 released in November 2021.

The System of Environmental-Economic Accounting 2012 Central Framework (SEEA-CF) serves as the framework for this study. It is a multipurpose conceptual framework that quantitatively describes the interaction between the environment and the economy. It is also a statistical framework that consists of a comprehensive set of tables and accounts which guides the compilation of consistent and comparable statistics and indicators for policymaking, analysis, and research.

The SEEA Central Framework covers measurement in three main areas: (1) the flows of resources within the economy and between the economy and the environment; (2) the economic activity and transactions related to the environment; and (3) the stocks and the changes in stocks of environmental assets, such as energy resources, which is the focus of this study.

The accounts provide information on the available stocks of the four non-renewable energy resources at the start and end of each year, as well as the changes that occurred during the period. These energy resources were also classified following the United Nations Framework Classification for Fossil Energy and Mineral Resources (UNFC-2009) as follows: Class A, commercially recoverable resources; Class B, potentially commercially recoverable resources; and Class C, non-commercial and other known deposits.

A basic physical asset account for energy resources is compiled by type of resources, each with the same unit of measurement, and by class of resources.

Table 1. Structure of physical asset account for energy resources

	Volume of energy resources (by type of energy resource, by class)	
Opening stock		
Additions to stock		
Discoveries		
Upward reappraisals		
Reclassifications		
<i>Total additions to stock</i>		
Reductions in stock		
Extractions		
Catastrophic losses		
Downward reappraisals		
Reclassifications		
<i>Total reductions in stock</i>		
Closing stock		

The structure of the monetary asset account is similar to that of the physical asset account but with an additional entry: revaluations. It is recommended to value only Class A deposits in monetary terms.

Table 2. Structure of monetary asset account for energy resources

	Value of energy resources (by type of energy resource, Class A)	
Opening stock		
Additions to stock		
Discoveries		
Upward reappraisals		
Reclassifications		
<i>Total additions to stock</i>		
Reductions in stock		
Extractions		
Catastrophic losses		
Downward reappraisals		
Reclassifications		
<i>Total reductions in stock</i>		
<i>Revaluations</i>		
Closing stock		

II. Data Sources

The data for estimating the physical and monetary asset accounts were gathered from the following:

Data	Data Sources
<ul style="list-style-type: none"> ● Reserves and extractions of coal, oil, natural gas, and condensate 	Energy Resource Development Bureau, Department of Energy
<ul style="list-style-type: none"> ● National Accounts of the Philippines, 2000 to 2021 ● 2018 Input-Output Tables ● Total revenue, book value of fixed assets, and interest expense of establishments engaged in Mining and Quarrying 	Philippine Statistics Authority
<ul style="list-style-type: none"> ● Treasury bill rates (2000 to 2021) 	Bangko Sentral ng Pilipinas
<ul style="list-style-type: none"> ● Social discount rate 	National Economic Development Authority

III. Estimation Methodology

A. Physical Asset Accounts

1. Encoded the available inventory/stock data and annual production data by region for coal and by service contracts for oil, natural gas, and condensate.
2. Determined the year of discovery based on the energy resource inventory and information on the service contracts.
3. Estimated the opening stocks, closing stocks and reappraisals (balancing item using residual method) based on the available data and determined the appropriate class using the criteria discussed in the next section.
4. Determine the timepoints when reclassifications occurred and the corresponding stocks for each contractor.
5. Consolidated the results by class.

B. Monetary Asset Accounts

1. Using the 2018 Input-Output Table, the ratios of compensation of employees, consumption of fixed capital, and taxes less subsidies to gross output by sub-industry were calculated.
2. Multiplied the ratio to the Gross Output series to estimate the respective values from 2000 to 2021.
3. Compute Gross and Net Operating Surplus.
4. Collected data on book value of fixed assets, total revenue, and interest expense from the CPBI and ASPBI. Ratios of book value of fixed assets and interest expenses to total revenue were calculated.
5. Compute Return to Produced Assets.

$$\text{Return to Produced Asset} = \text{Ratio} \times \text{Gross Output} \times \text{Treasury Bill rate}$$

6. Computed the Resource Rent.

Resource Rent

$$= \text{Net Operating Surplus} - (\text{Return to Produced Asset} + \text{Interest Expense})$$

7. Derived the asset life for each resource.

$$\text{Asset Life} = \frac{\text{Closing Stocks of Class A}}{\text{Extractions}}$$

8. Computed the resource value using the Net Present Value (NPV) method, and unit resource value.

$$\text{Resource value} = \sum_{t=1}^t \frac{RR_t}{(1+r)^t}$$

where RR is the resource rent

r is the discount rate

t is the asset life

$$\text{Unit Resource Value} = \frac{\text{Resource Value}}{\text{Closing Stocks of Class A}}$$

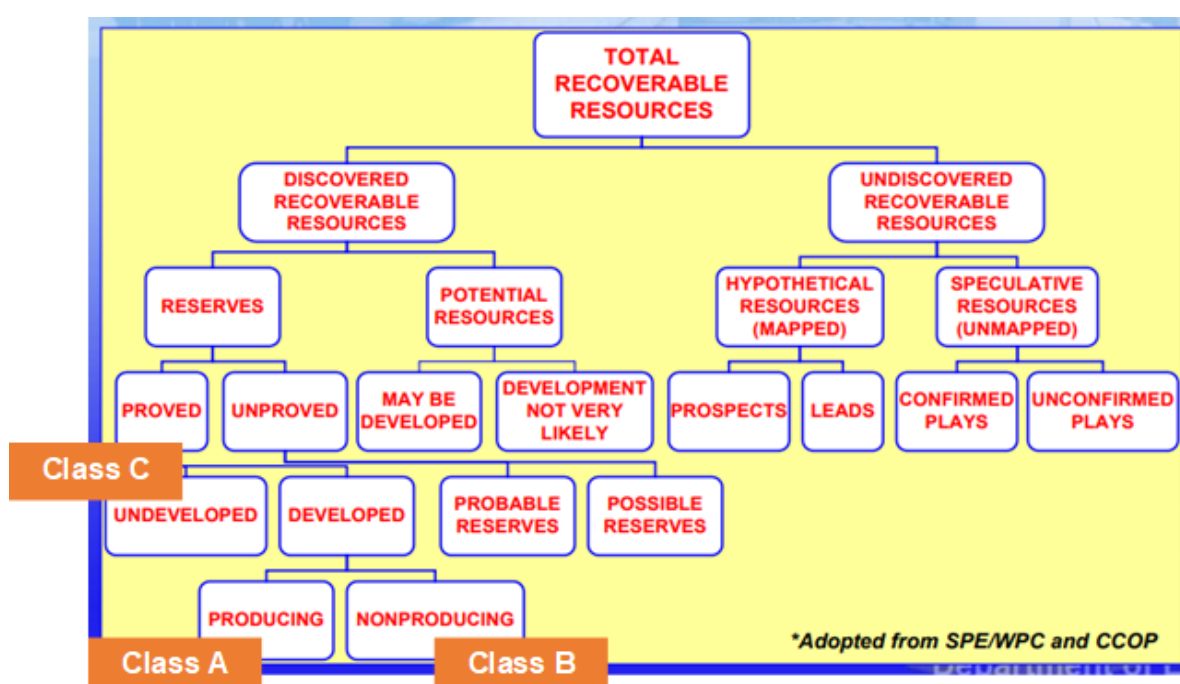
9. Multiplied the unit resource value to the entries in the Class A physical asset account to come up with the monetary asset accounts. Estimate the revaluations using residual method.

C. Operationalized Classification Criteria

The classification of coal resources was based on the localized UNFC-2009 used for the compilation of the Mineral Accounts of the Philippines through the Wealth Accounting and the Valuation of Ecosystem Services (WAVES) Project. Moreover, the classification of oil, natural gas, and condensate resources was based on the Philippine Petroleum Resource Classification System.

Class	Criteria for Coal Resources
A	Producing during the reference year
B	Not yet producing during the reference year but has production in succeeding years
	Suspended operation for one year; Temporary suspension
C	Not producing during the reference year and no production in succeeding years
	Stopped operation for 2 or more years; Permanently stopped operations
	Inactive; Expired contract and not applying for renewal

Philippine Petroleum Resource Classification System



IV. Definition of Terms

- a. Asset is a store of value representing a benefit or series of benefits accruing to an economic owner by holding or using the entity over a period of time. It is a means of carrying forward value from one accounting period to another.
- b. Environmental assets are the naturally occurring living and non-living components of the Earth, together constituting the biophysical environment, which may provide benefits to humanity.
- c. Individual environmental assets are those assets that may provide resources for use in economic activity. They comprise mineral and energy resources, land, soil resources, timber resources, aquatic resources, other biological resources, and water resources.
- d. Catastrophic losses rarely occur with energy resources. Catastrophes such as collapsing of mines may occur but this does not reduce the stocks of the resources.
- e. Depletion, in physical terms, is the decrease in the quantity of the stock of a natural resource over an accounting period that is due to the extraction of the natural resource by economic units occurring at a level greater than that of regeneration.
- f. Discoveries are additions representing the arrival of new resources to a stock and commonly arise through exploration and evaluation.
- g. Extractions are reductions in stock due to physical removal or harvest of an environmental asset through a process of production.
- h. Energy resources comprise known deposits of coal, oil, and natural gas resources.
- i. Reappraisals reflect changes in the measured stock of assets due to the use of updated information that permits a reassessment of the size of the stock.
- j. Reclassifications are changes in assets that result from situations in which an asset is used for a different purpose. A reclassification of

an asset in one category should be offset by an equivalent reclassification in another category.

- k. Revaluations relate to changes in the value of assets due to price changes.

Source: *System of Environmental-Economic Accounting 2012 Central Framework*

V. Dissemination of Results and Revision

The Energy Accounts is updated annually on the PSA website. The web release materials include press release, statistical tables, and infographics.

List of Statistical Tables:

Coal

Table 1.1 Physical Asset Account: Class A Coal Reserves, 2000 to 2021

Table 1.2 Physical Asset Account: Class B Coal Reserves, 2000 to 2021

Table 1.3 Physical Asset Account: Class C Coal Reserves, 2000 to 2021

Table 1.4 Physical Asset Account: Total Coal Reserves, 2000 to 2021

Table 1.5 Amount of Coal Reserves by Class, 2000 to 2021

Table 1.6 Monetary Asset Accounts: Class A Coal Reserves at 10% discount rate

Oil

Table 2.1 Physical Asset Account: Class A Oil Reserves, 2000 to 2021

Table 2.2 Physical Asset Account: Class B Oil Reserves, 2000 to 2021

Table 2.3 Physical Asset Account: Class C Oil Reserves, 2000 to 2021

Table 2.4 Physical Asset Account: Total Oil Reserves, 2000 to 2021

Table 2.5 Amount of Oil Reserves by Class, 2000 to 2021

Table 2.6 Monetary Asset Accounts: Class A Oil Reserves at 10% discount rate

Natural Gas

Table 3.1 Physical Asset Account: Class A Natural Gas Reserves, 2000 to 2021

Table 3.2 Physical Asset Account: Class B Natural Gas Reserves, 2000 to 2021

Table 3.3 Physical Asset Account: Class C Natural Gas Reserves, 2000 to 2021

Table 3.4 Physical Asset Account: Total Natural Gas Reserves, 2000 to 2021

Table 3.5 Amount of Natural Gas Reserves by Class, 2000 to 2021

Table 3.6 Monetary Asset Accounts: Class A Natural Gas Reserves at 10% discount rate

Condensate

Table 4.1 Physical Asset Account: Class A Condensate Reserves, 2000 to 2021

Table 4.2 Physical Asset Account: Class B Condensate Reserves, 2000 to 2021

Table 4.3 Physical Asset Account: Class C Condensate Reserves, 2000 to 2021

Table 4.4 Physical Asset Account: Total Condensate Reserves, 2000 to 2021

Table 4.5 Amount of Condensate by Class, 2000 to 2021

Table 4.6 Monetary Asset Accounts: Class A Condensate Reserves at 10% discount rate

Resource Rent

Table 5.1 Non-Renewable Energy Resource Rents, 2000 to 2021

Table 5.2 Non-Renewable Energy Resource Rents as % of GDP, 2000 to 2021

VI. Citation

Philippine Statistics Authority. (24 November 2022). *Technical Notes on 2000 - 2021 Energy Asset Accounts*. <https://psa.gov.ph/content/philippines%E2%80%99-class-coal-oil-natural-gas-and-condensate-reserves-valued-php-24199-billion>

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