



## **TECHNICAL NOTES**

### **Energy Accounts of the Philippines: Asset Accounts**

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#### **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. The accounts are updated on an annual basis.

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 compilation.

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**

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

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**

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

## 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"> <li>Reserves and extractions of coal, oil, natural gas, and condensate</li> </ul>	Energy Resource Development Bureau, Department of Energy
<ul style="list-style-type: none"> <li>Gross Value Added in Mining and Quarrying</li> <li>2018 Input-Output Tables</li> <li>Total revenue, book value of fixed assets, and interest expense of establishments engaged in Mining and Quarrying</li> </ul>	Philippine Statistics Authority
<ul style="list-style-type: none"> <li>Treasury bill rates</li> </ul>	Bangko Sentral ng Pilipinas
<ul style="list-style-type: none"> <li>Social discount rate</li> </ul>	National Economic Development Authority

## III. Estimation Methodology

### A. Physical Asset Accounts

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

## B. Monetary Asset Accounts

1. Calculate the ratios of compensation of employees, consumption of fixed capital, and taxes less subsidies to gross output by sub-industry using the 2018 Input-Output Table.
2. Estimate the annual compensation of employees, consumption of fixed capital, and taxes less subsidies using the results from Step 1.
3. Compute Gross and Net Operating Surplus.
4. Collect data on the book value of fixed assets, total revenue, and interest expense from the ASPBI. Calculate ratio of book value of fixed assets to total revenue (i.e.,  $Ratio_{BVFA}$ ) and interest expense to total revenue (i.e.,  $Ratio_{IE}$ ).
5. Compute Return to Produced Assets.

$$Return\ to\ Produced\ Asset = Ratio_{BVFA} \times Gross\ Output \times Treasury\ Bill\ rate$$

6. Compute the Resource Rent.

$$Resource\ Rent = NOS - Return\ to\ Produced\ Asset - (Ratio_{IE} \times Gross\ Output)$$

7. Derive the asset life for each resource.

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

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

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

where RR is the resource rent  
r is the discount rate  
t is the asset life

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

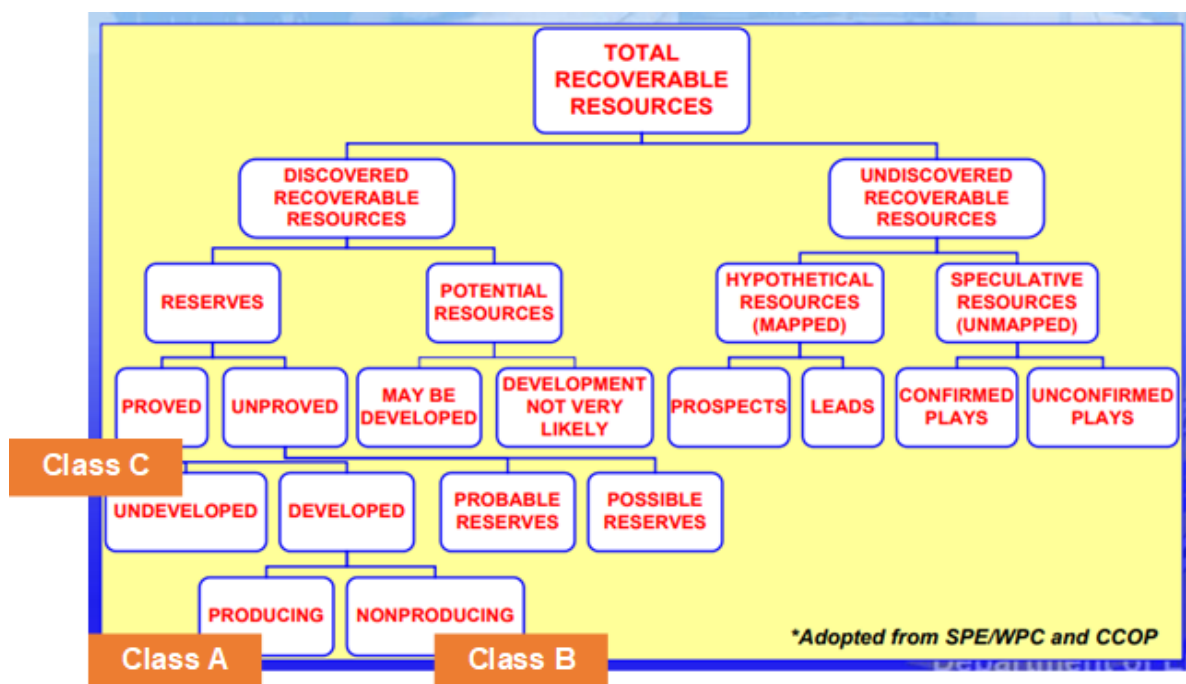
9. Multiply the unit resource value to the entries in the Class A physical asset account to come up with the monetary asset accounts. Estimate the revaluations using residual method.

### 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 – 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 – 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 – 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) – 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 – additions representing the arrival of new resources to a stock and commonly arise through exploration and evaluation.
- g. Extractions – 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 – 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. Resource rent – the surplus value accruing to the extractor or user of an asset calculated after all costs and normal returns have been taken into account.
- l. 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 of the Philippines is updated annually in the PSA website. The web release materials include press release, statistical tables, and infographics.

List of Statistical Tables:

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- Table 1.3 Physical Asset Account: Class C Coal Reserves
- Table 1.4 Physical Asset Account: Total Coal Reserves
- Table 1.5 Amount of Coal Reserves by Class
- Table 1.6 Monetary Asset Accounts: Class A Coal Reserves

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- Table 2.1 Physical Asset Account: Class A Oil Reserves
- Table 2.2 Physical Asset Account: Class B Oil Reserves
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- Table 3.6 Monetary Asset Accounts: Class A Natural Gas Reserves

### **Condensate**

Table 4.1 Physical Asset Account: Class A Condensate Reserves

Table 4.2 Physical Asset Account: Class B Condensate Reserves

Table 4.3 Physical Asset Account: Class C Condensate Reserves

Table 4.4 Physical Asset Account: Total Condensate Reserves

Table 4.5 Amount of Condensate by Class

Table 4.6 Monetary Asset Accounts: Class A Condensate Reserves

### **Resource Rent**

Table 5.1 Non-Renewable Energy Resource Rents

Table 5.2 Non-Renewable Energy Resource Rents as % of GDP

## **VI. Citation**

Philippine Statistics Authority. (23 November 2023). *Technical Notes on the Energy Accounts of the Philippines: Asset Accounts*. <https://psa.gov.ph/content/reserves-coal-oil-natural-gas-and-condensate-amounted-php-59422-billion-2022>

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