**TECHNICAL NOTES**
**2000 – 2019 Energy Accounts**

## I.     Conceptual Framework

The Energy Accounts of the Philippines is a publication that presents the physical and monetary asset accounts for coal, oil, natural gas, and condensate. This is an update of the pilot compilation released last January 2019.

The System of Environmental-Economic Accounting (SEEA) 2012– Central Framework, a multi-purpose framework for measuring the environment and its interaction with the economy, serves as the framework for this study. 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 main focus of this study.

The accounts provide information on the available stocks of these 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**

| | Type of energy resource (Class A: Commercially recoverable resources) |
|---|---|
| **Opening stock** | |
| **Additions to stock** | |
| Discoveries | |
| Upward reappraisals | |
| Reclassifications | |
| *Total additions to stock* | |
| **Reductions in stock** | |
| Extractions | |
| Catastrophic losses | |
| Downward reappraisals | |
| Reclassifications | |
| *Total reductions in stock* | |
| **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**

| | Type of energy resource (Class A: Commercially recoverable resources) |
|---|---|
| **Opening stock** | |
| **Additions to stock** | |
| Discoveries | |
| Upward reappraisals | |
| Reclassifications | |
| *Total additions to stock* | |
| **Reductions in stock** | |
| Extractions | |
| Catastrophic losses | |
| Downward reappraisals | |
| Reclassifications | |
| *Total reductions in stock* | |
| *Revaluations* | |
| **Closing stock** | |

## II. Data Sources

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

| Data | Data Sources |
|---|---|
| ● Reserves and extractions of coal, oil, natural gas, and condensate | Energy Resource Development Bureau, Department of Energy |
| ● Gross Value Added (2000 to 2019)<br>● Gross Output (2000 to 2019)<br>● 2018 Use Table<br>● Total revenue, book value of fixed assets, and interest expense | Philippine Statistics Authority |
| ● Treasury bill rates | Bangko Sentral ng Pilipinas |
| ● Social discount rate | National Economic Development Authority |

## III. Estimation Methodology

### III.1 Physical Asset Accounts
1. Encoded the available data and set up the physical asset accounts 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 and recorded the reserves data as discoveries on that year.
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 below.
4. Determined the timepoints when reclassifications occurred and the corresponding stocks for each contractor.
5. Consolidated the results by class.

### III.2 Monetary Asset Accounts
1. Using the 2018 Use Table, calculate the ratio of compensation of employees, consumption of fixed capital, and taxes less subsidies to gross output by industry.
2. Multiplied the ratio to the Gross Output series to estimate the respective values from 2000 to 2019.

3.  Computed Gross and Net Operating Surplus (NOS).
4.  Collected data from the results of the Census of Philippine Business and Industry (CPBI) and the Annual Survey of Philippine Business and Industry (ASPBI). Estimated book value of fixed assets, total revenue, and interest expense for years without available data. Calculate ratio of book value to total revenue.
5.  Computed return to produced assets.

$$Return\ to\ Produced\ Assets \\ = Ratio\ \times Gross\ Output\ \times Treasury\ Bill\ rate$$

6.  Computed the resource rent.

$$Resource\ Rent \\ = NOS - Return\ to\ Produced\ Assets \\ - Interest\ Expense$$

7.  Derived the asset life for each resource.

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

8.  Computed 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.  Multiplied the unit resource value to the entries in the Class A physical asset account to come up with the monetary asset accounts.
10.  Estimated the revaluations using residual method.

### III.3 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.

| Class | Criteria |
|:---:|:---|
| A | Producing during the reference year |
| B | Not yet producing during the reference year but has production in succeeding years |
| C | Not producing during the reference year and no production in succeeding years |

Moreover, the classification of oil, natural gas, and condensate resources was based on the Philippine Petroleum Resource Classification System.

| Class | Philippine Petroleum Resource Classification | |
|:---:|:---|:---|
| **A** | **Producing** | Resources are expected to be recovered from completion intervals which are open and producing at the same time of the estimate. |
| **B** | **Non-producing** | This includes shut-in and behind-pipe reserves that are expected to be recovered from zones in existing wells which will require additional completion of work or future re-completion prior to the start of the production. |
| **C** | **Undeveloped** | This includes reserves that are expected to be recovered from new wells. |

## 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** are 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.

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

## V.    Dissemination of Results and Revision

The Energy Accounts is released annually in the PSA website. The web release materials include press release, statistical tables, infographics, and social cards.

List of Tables and Accounts

- A. Physical asset accounts for Total Coal Reserves, Class A, B and C, in metric tons
- B. Physical asset accounts for Total Oil Reserves, Class A, B and C, in barrels
- C. Physical asset accounts for Total Natural Gas Reserves, Class A, B and C, in cubic feet of gas
- D. Physical asset accounts for Total Condensate Reserves, Class A, B and C, in barrels
- E. Monetary asset accounts for Class A Coal, Oil, Natural Gas, and Condensate Reserves at 10% discount rate, in pesos

## VI.    Citation

Philippine Statistics Authority. (05 January 2021). *Technical Notes on 2000 – 2019 Energy Accounts.* *https://psa.gov.ph/sites/default/files/attachments/ird/pressrelease/3.%20 Technical%20Notes_Energy%20Accounts%20%282000%20to%202019 %29_signed.pdf*

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