



**15TH NATIONAL
CONVENTION
ON STATISTICS**

03-05 OCTOBER 2022

*Organized by the Philippine Statistical System
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Developing Material Flow Accounts of the Philippines

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Session on Environment and Ecosystem Accounts
Crowne Plaza Galleria Manila
05 October 2022, 8:30 am



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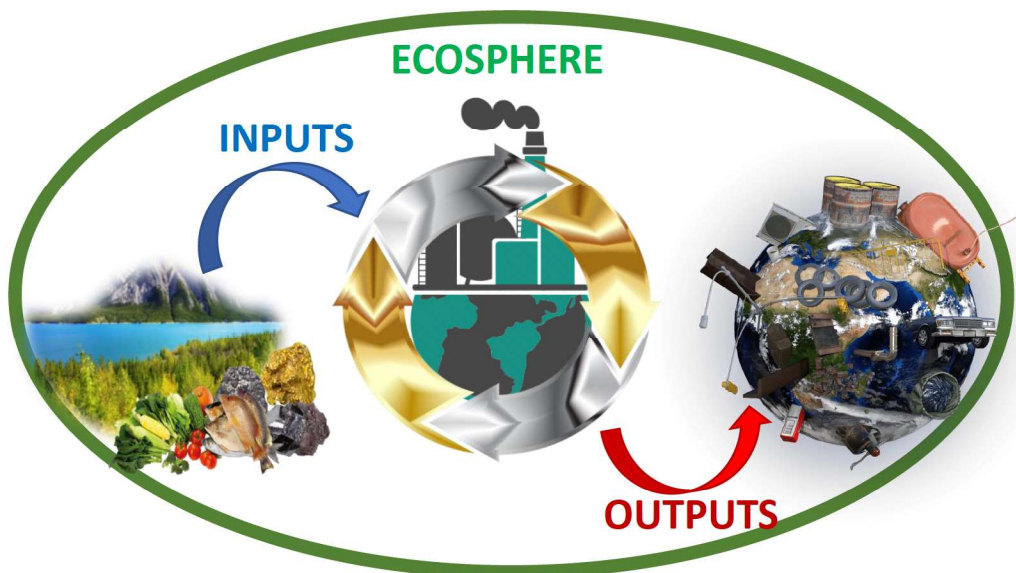


Introduction

Material Flow Accounts (MFA) provide a physical measurement of the relationship between the economy and the environment, including inputs from the environment, flows of materials back to the environment, and the physical amounts of imports and exports.

Organization for Economic Co-operation and Development (OECD), 2008

Concept of Social Metabolism



Physical exchange between economy/society and environment
Source: Potsdam Institute for Climate Impact Research (PIK)

Objectives

- EW-MFA based accounts and indicators deliver a very comprehensive overview of natural resource extraction, trade in natural resources, waste disposal and emissions.
- They measure environmental pressures of natural resource use,
- EW-MFA based headline indicators have been used as a proxy for overall environmental pressure and impact of a national economy.
- EW-MFA describe in terms of material flows the interaction between the national economy, the natural environment, and the rest of the world.



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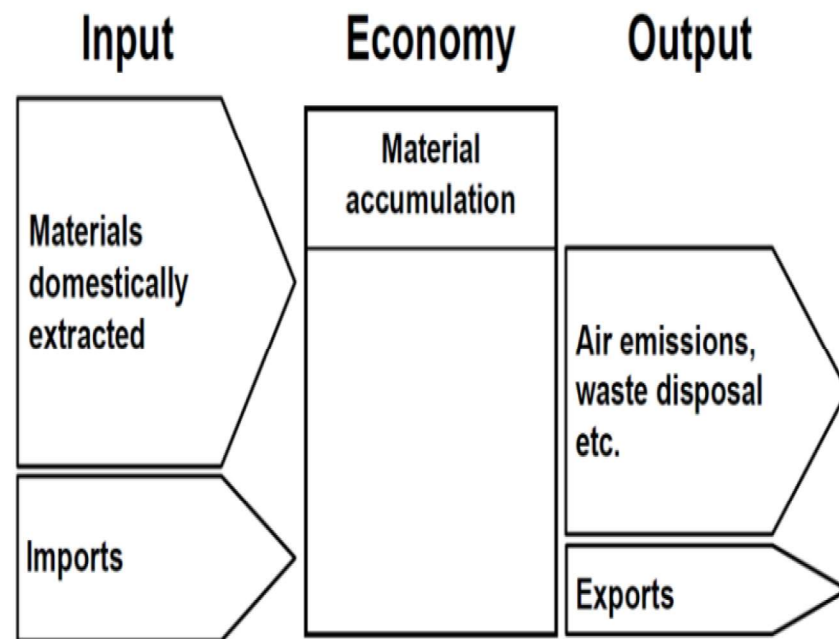
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Scope and Limitations

The global EW-MFA manual provides guidance for national statistical offices for the compilation of simple material flow data sets that focus on primary material extraction, physical trade waste and emissions. Densities of some non-metallic minerals were not found in the manual, thus the conversion factor may not be close to its metric equivalent. Estimates regarding wastes and emissions have not been calculated.





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Conceptual Framework

The core account for economy-wide material flows only contains information on domestic extraction, imports, and exports. Components under Material Input are the following:

1. Domestic Extraction (DE)

- Biomass
- Metal Ores
- Non-metallic minerals
- Fossil fuels

2. Imports and Exports

PHYSICAL SUPPLY TABLE				
	Total Economy	Rest of the world	Flows from the environment	TOTAL SUPPLY
Natural inputs (tonnes)				
Biomass				
Metal ores (gross ores)				
Non-metallic minerals				
Fossil energy materials/carriers				
TOTAL				
Products (tonnes)				
Biomass and biomass products				
Metal ores and concentrates, raw and processed				
Non-metallic minerals, raw and processed				
Fossil energy materials/carriers, raw and processed				
Other products				
Waste imported for final treatment and disposal				
TOTAL				
TOTAL SUPPLY				
PHYSICAL USE TABLE				
	Total Economy	Rest of the world	Flows to the environment	TOTAL USE
Natural inputs (tonnes)				
Biomass				
Metal ores (gross ores)				
Non-metallic minerals				
Fossil energy materials/carriers				
TOTAL				
Products (tonnes)				
Biomass and biomass products				
Metal ores and concentrates, raw and processed				
Non-metallic minerals, raw and processed				
Fossil energy materials/carriers, raw and processed				
Other products				
Waste imported for final treatment and disposal				
TOTAL				
TOTAL USE				



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Source of Data

Major Statistics	Subcategories	Data Sources
Biomass	<ul style="list-style-type: none">– Agricultural Crops– Wood– Fisheries (Wild Harvest)	Crops Statistics Division, PSA Forest Management Bureau, DENR Fisheries Statistics Division, PSA
Metal Ores and Contained Metals		Mines and Geosciences Bureau, DENR
Non-metallic minerals		Mines and Geosciences Bureau, DENR (MGB-Regional)
Fossil Fuels		Department of Energy
Physical Trade	<ul style="list-style-type: none">- Biomass- Metal Ores- Fossil Energy	Trade Statistics Division, PSA



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Methodology

$$DE_{(t)} = \sum_x^y \{B_{x(t)} + F_{x(t)} + M_{x(t)} + C_{x(t)}\}$$

where:

$DE_{(t)}$ = domestic extraction at year t totaling all types of material from x to y for each categories.

The material categories are:

$B_{x(t)}$ = extracted biomass of specific material x in specific year t ,

$F_{x(t)}$ = amount of extracted fossil fuel x in specific year t ,

$M_{x(t)}$ = extracted metal ores and industrial minerals type x ,

$C_{x(t)}$ = amount of extracted construction minerals x in specific year



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Methodology

Domestic Material Input (DMI) = Domestic Extraction (DE) + Imports (IM)

Domestic Material Consumption (DMC) = DMI - Exports (EX)

Physical Trade Balance (PTB) = Imports (IM) - Exports (EX)

Material Productivity (MP) = Gross Domestic Product (GDP) / DMC

Material Intensity (MI) = DMC / GDP



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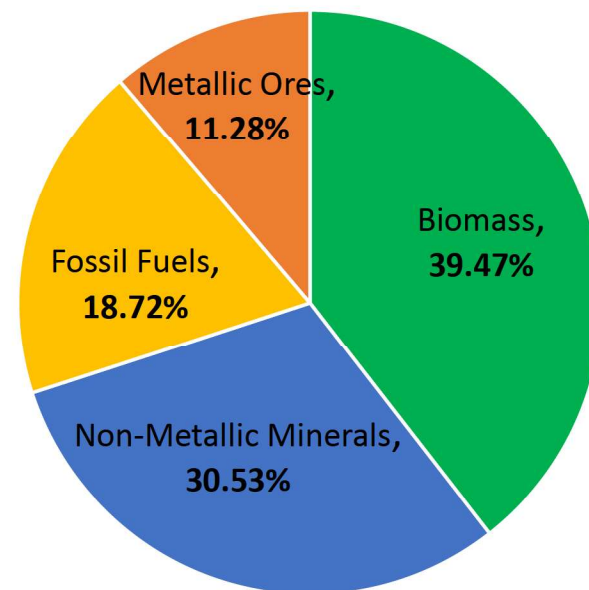
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Results and Discussion

	Domestic Extraction	Export of Materials	Import of Materials
Biomass	116,672,362.41	8,130,848.13	20,235,000.26
Metallic Ores	27,934,976.01	43,373,432.60	11,179,697.00
Non-Metallic Minerals	93,449,728.39	803,496.71	12,420,244.89
Fossil Fuels	4,115,360.19	30,006,758.77	60,817,194.21
TOTAL	242,172,427.01	82,314,536.21	104,652,136.36





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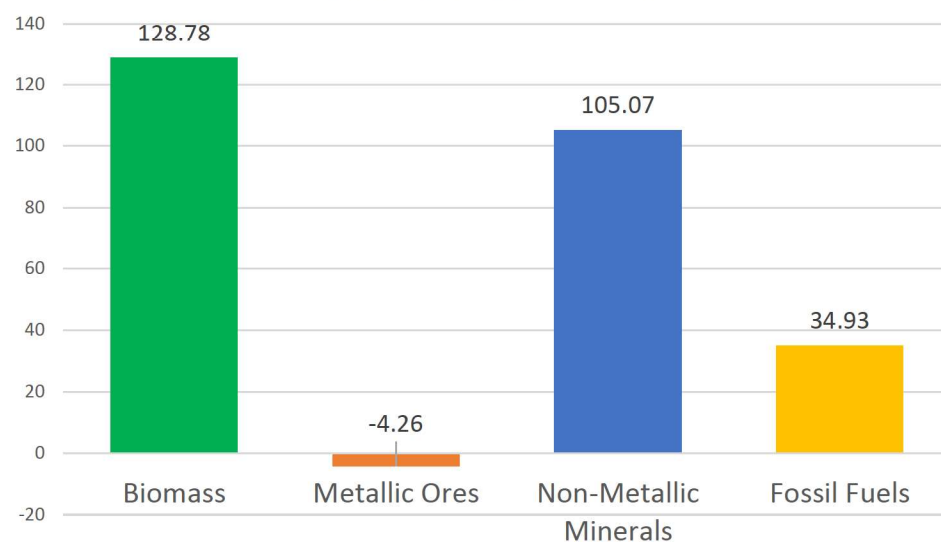
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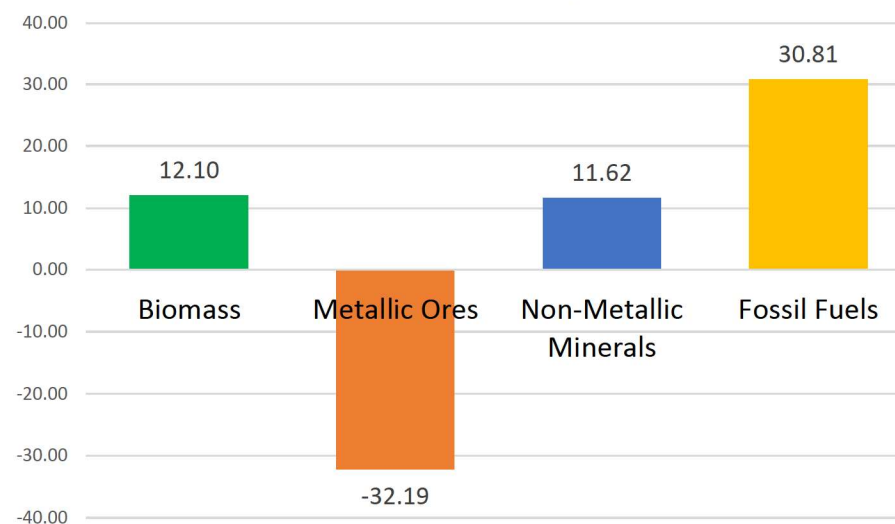


Results and Discussion

2020 Domestic Material Consumption
in million metric tons



2020 Physical Trade Balance
in million metric tons





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Ways Forward

- Development of Domestic Processed Output which records the outflows of materials from the economy to different environmental media including the amounts of waste going to landfill, emissions to air and emissions to water.



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Thank you!



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