NATIONAL STATISTICS OFFICE OF MONGOLIA

Workshop on an Accounting Approach to Climate Change and Biodiversity in Central Asia and the Caucasus (9-12, September 2024), Bishkek, Kyrgyz Republic

Estimating Climate Change Related Indicators from SEEA Energy Accounts (PEFA) of Mongolia

National Accounts Division,
National Statistics Office of Mongolia

Outline:

- Legal framework
- Environmental-Economic Accounting Implementation in Mongolia
- Climate change related indicators from SEEA-Energy accounts
- Challenges
- Way Forward

Legal Framework

✓ Environmental Laws

- Law on Environmental Protection; Law on Water; Law on Forest; Law on Forest; Law on Air; Law on Special Protected Areas; Law on Environmental Impact Assessment; Law on Soil Protection and combat desertification…)

✓ “Vision - 2050” Long-Term Development Policy of Mongolia

- *Goal 6. Green Development (SDG - 2030)*

✓ Law on Statistics, NSO of Mongolia mandate to:

- Coordinate Mongolian statistical system;
- Conduct censuses and surveys and generate data from censuses and surveys and other administrative based data, like foreign trade statistics;
- Produce official statistics (including social, economic and environmental indicators);

✓ National Program for Development of Official Statistics, 2021-2025

- *Implementation of SEEA (SEEA CF, FDES)*

National Accounts Division, Integrated Statistics Department

SEEA accounts

- Development and compilation of environmental-economic accounts
- Estimation of indicators on environmental-economic related indicators, climate change, SDG

Economic Statistics Department

Environmental statistics

- Development and compilation of environmental statistics
- Collection and maintenance of statistics and indicators on environment, climate change, disasters
- Coordination and technical support to statistical inter agency task force, and technical working groups on environmental statistics

Brief History of SEEA Implementation in Mongolia

How we started:

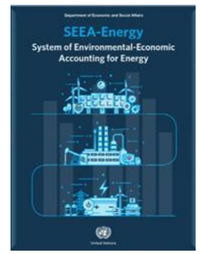
2013-2015	Studied SEEA Central Framework
	An assessment was made of the sources and quality of environmental statistical data.
	A memorandum of cooperation was signed with the Ministry of Environment
	Material Flow Accounts, experimentally, for 2005-2013
	Action plan for implementation of SEEA
2016 -2018	Sample survey on data collection for EPEA
	By ADB support, Energy account PSUT, Env.tax accounts, Material Flow Accounts
	Environmental protection expenditure accounts
2019-2023	SEEA Central Framework -2012 officially translated in Mongolian language
	identified data availability Sold waste, Air emission accounts in support with ESCAP, international consulting services
	Water accounts, Solid waste accounts, experimentally

PEFA – PHYSICAL ENERGY FLOW ACCOUNTS

Accounts Compiled:

Physical Energy Flow Accounts (PEFA) compiled since 2015, annual basis.

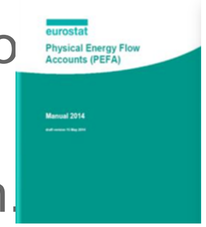
- **Framework:** SEEA CF 2012
- **International organizations manual and guidelines:**



System of Environmental-Economic Accounts, Central Framework (SEEA-CF), 2014

Physical Energy Flow Accounts (PEFA), Eurostat, 2014

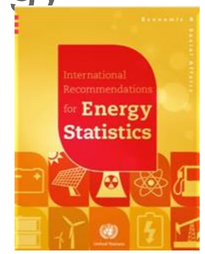
Physical energy flow accounts (PEFA) questionnaire



Industry classification - ISIC, UN, International Standard Industry Classification of all Eco Activities, rev. 4.

Harmonized System (HS) for the classification of products, World Customs Organization.

Data on conversion factors of fuel products, UN, International recommendations for energy statistics (IRES), 2016



SIEC in IRES

PEFA – PHYSICAL ENERGY FLOW ACCOUNT S

Main data sources

- Business register database
- Foreign trade statistics
- Input-Output tables
- Livestock census
- Household Income and Expenditure Survey
- Industrial statistics
- International data sources
- Industrial statistics
- Construction statistics
- Base surveys on Energy production and consumption
- VAT: Register Database
- Database of electricity and heat distributing companies

Starting points:

- No established regular energy balances;
- Only heat (incomplete) electricity and coal production statistics;
- No information of energy use – Who uses energy? Only some info available National Accounts (Use table, monetary only).

PEFA - PHYSICAL ENERGY FLOW ACCOUNT S

We also collected data from different sources:

- **Survey**
  - Importers – *what they purchased & sold to whom*
  - Electricity producers, Thermal heat producers and Coal Mines – *how much they produced and sold to whom*
  - Sample survey for Agriculture, Manufacturing, Construction, Water and sewerage industries - *how much they used*
- **Databases / registers to figure out Who is using these products**
  - Electricity distributors, heat distributors
  - VAT register – petrol purchases
- **Calculations for households living in ger areas /traditional dwelling/**
  - Nomadic herder households
  - Households living in ger areas in urban
  - Households living in ger areas in rural

COMPILATION OF PEFA

Code	PRODUCTS	TOTAL SUPPLY, TJ
P00	ENERGY PRODUCTS	829 219.8
P08	Hard coal	475 931.1
P09	Brown coal	126 934.5
P12	Crude oil	51 914.3
P13	Motor spirit (without bio)	19 178.5
P14	Other spirits	389.2
P15	Kerosene	195.8
P16	Transport diesel (without bio)	28 199.9
P17	Aviation Fuels	2 412.9
P18	Fuel Oils	128.5
P19	Lubricants	467.4
P20	Other petroleum products	68.8
P21	Other oils	37.2
P22	Waste oils	0.3
P23	LPG - Propane	555.9
P24	LPG - butane	562.8
P25	LPG -other	1.6
P26	Petroleum Jelly, paraffin waxes	2.7
P27	Bitumin	1 791.8
P28	Bitumen and asphalt, natural - Other	6.9
P29	Bituminous mixtures	107.3
P30	Wood, wood waste & other solid biomass, charcoal	30 423.8
P31	Electrical energy (million.kWh)	21 165.1
P32	Heat (Hot water) (thous.giga.cal)	66 036.5
P33	Heat (Steam) (thous.giga.cal)	2 660.6
P10	Coke and semi-coke of coal	32.5
P11	Briquettes, ovoids and similar solid fuels manufactured from coal	14.0

Extracted products

Imported products
(Petroleum products 100% import)

Produced products

COMPILATION OF PEFA

P11	Motor spirit (without bio)
	Petrol, A-80
	Petrol, A-92
	Petrol, A-95
	Petrol, A-98
P12	Other spirits
P14	Transport diesel (without bio)
P16	Lubricants
P21	LPG - Propane
P22	LPG - butane

Challenge 1: No data about the end use of these petroleum products by industries and households.

The HIES form contains questions on consumption of oil products but 2-3 products are combined in one item.

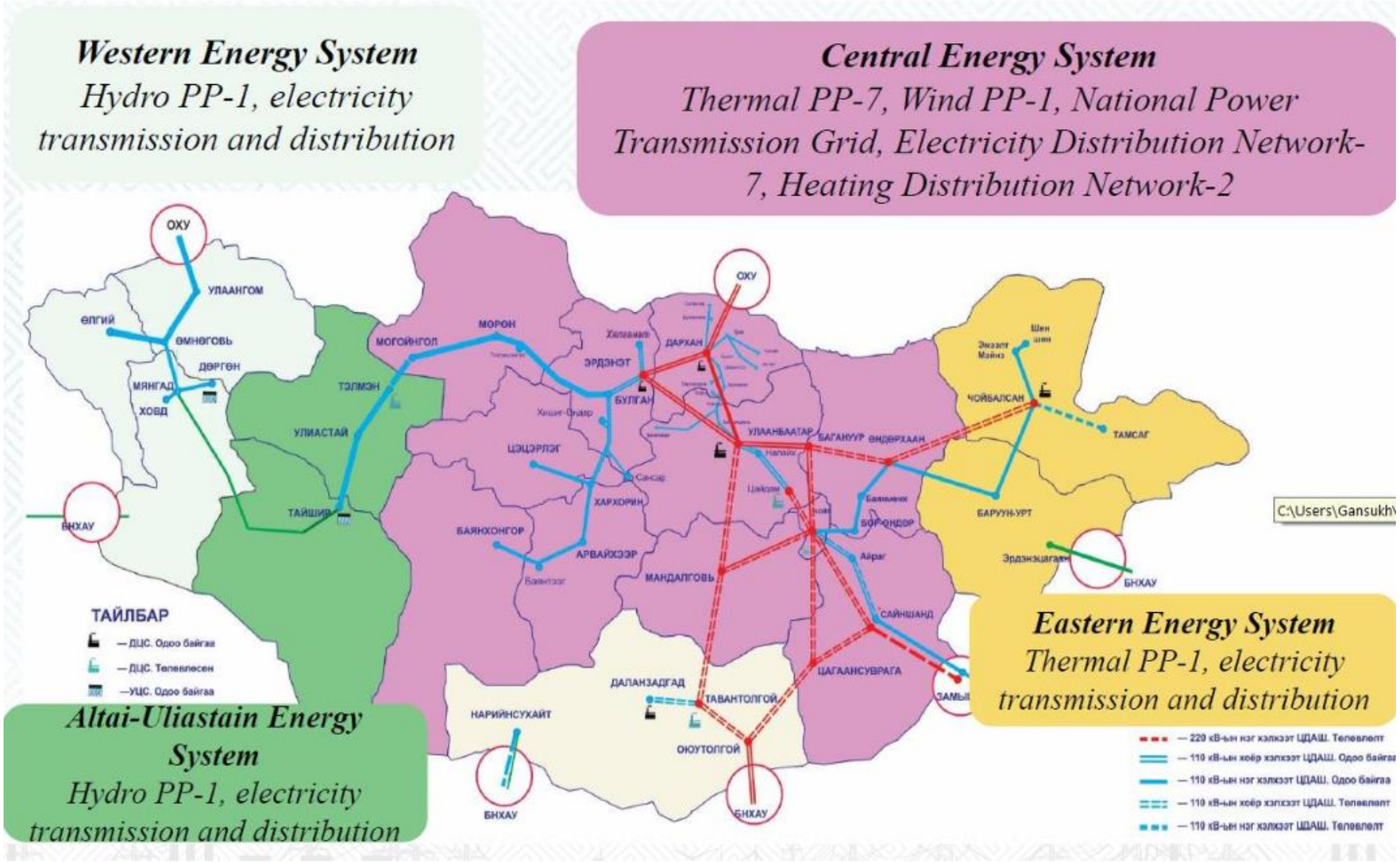
Solution: To use big data VAT register database

- There is a register listing all sales of products of which VAT is paid, including the sales of fuel-products from gas-stations (Physical and Monetary).
- The vast amounts of information in the VAT register data has been systematized according to ISIC-2-digit industries and by fuel-types.

The main purpose of considering the VAT-register as a possible data source for the PEFA were:

- The main source for the total use of fuels by industries
- To estimate the total household use of fuels (Total use of HHs = Total supply - Total use of fuels by industries)
- To calculate a distribution key for fuels for the different ISIC industries.

Structure of Energy (electricity) System



Source:
Ministry of Energy

COMPILATION OF PEFA

Challenge 2: **No data about the end use of electricity and heat by services industries and households.**

Solution: Databases were collected from 12 companies that distribute electricity and thermal energy to users.

- 11 companies supply 90.2% of total electricity to users.
- 1 company supply 62.3% of total heat to users in UB

The main purpose of considering the database as a possible data source for the PEFA were:

- The main source for the total use of electricity and heat by industries and HHs

Main Results - PEFA

TABLE A. PHYSICAL SUPPLY TABLE FOR ENERGY FLOWS, thous.TJ, 2022

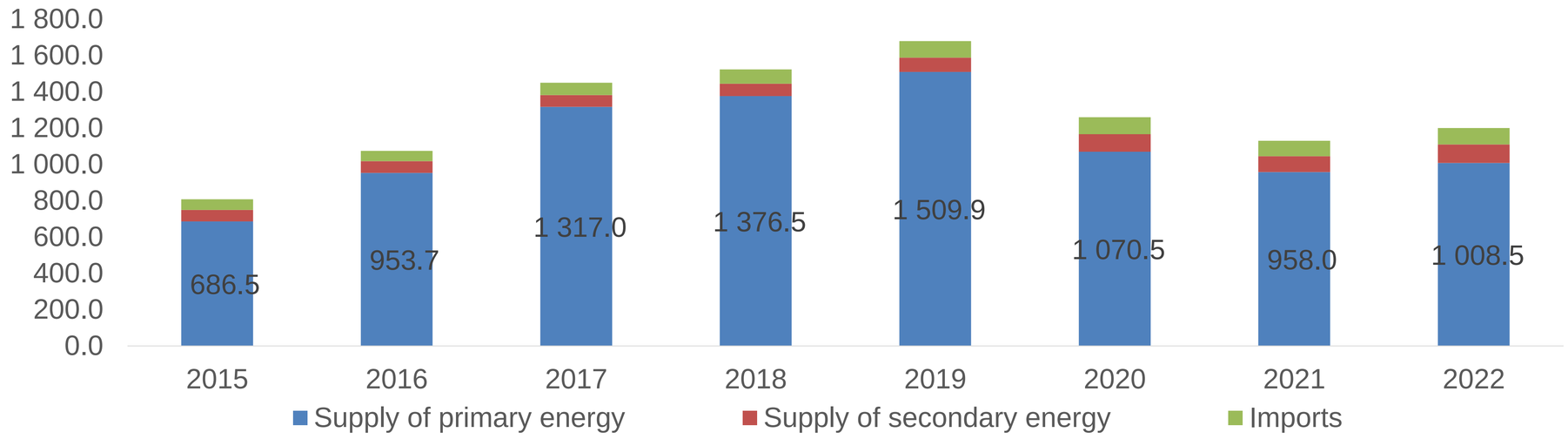
	Industries	Households	Accumu-lation	Flows from the ROW	Flows from Environment	Total Supply
Energy from natural inputs					**992.3**	**992.3**
Energy product	**1 110.2**			**90.2**		**1 200.4**
Energy residuals	**6.5**					**6.5**

TABLE B. PHYSICAL USE TABLE FOR ENERGY FLOWS, thous.TJ, 2022

	Industries	Households	Accumu-lation	Flows to the ROW	Flows from Environment	Total Use
Energy from natural inputs	**992.3**					**992.3**
Energy product	**130.5**	**129.1**	**80.6**	**860.2**		**1 200.4**
Energy residuals	**0.0**				**6.5**	**6.5**

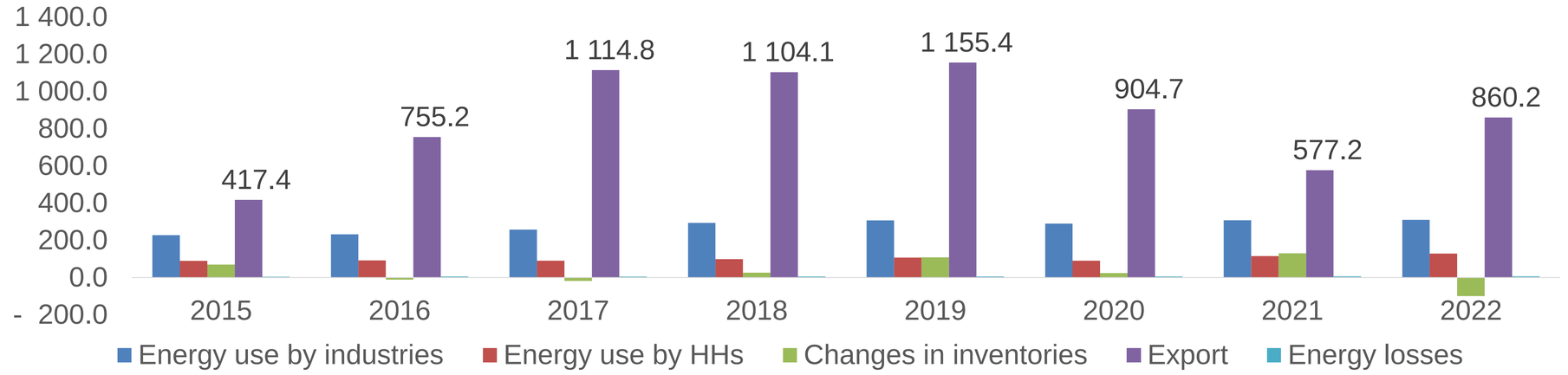
Main Results - PEFA

The energy total supply, thous.TJ



Tavan Tolgoi coal mine in Ömnögovi Province

The energy total use, thous.TJ

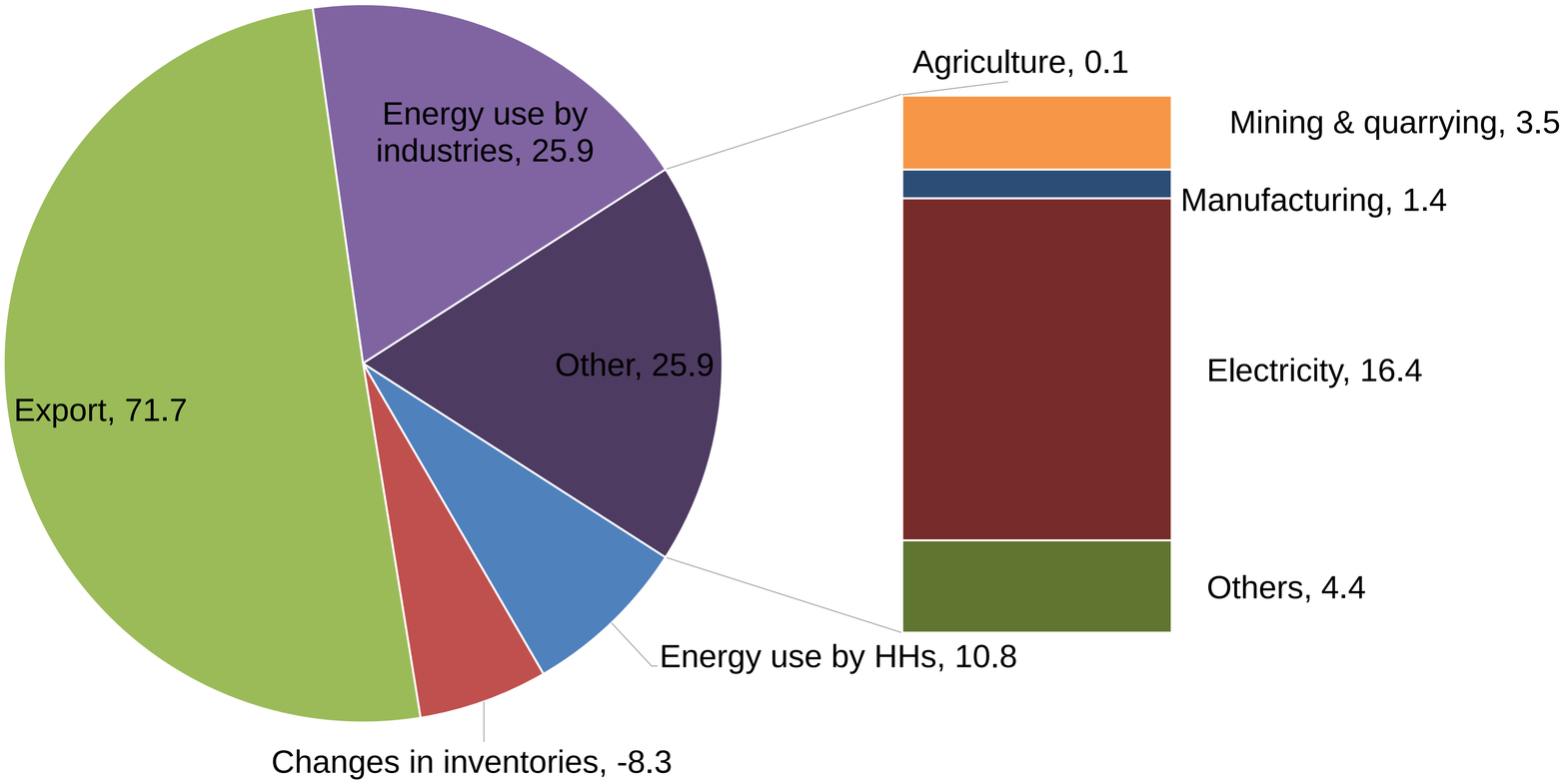


Climate Change Related Indicators from SEEA Energy Accounts

1a. Total energy use by national total, thous.TJ

	2015	2016	2017	2018	2019	2020	2021	2022
Total energy use	809.5	1 074.5	1 451.1	1 528.4	1 684.3	1 315.6	1 130.7	1 200.4
Energy use by national economy	392.1	319.2	336.2	424.3	528.9	410.9	553.5	340.1
Energy use for export	417.4	755.2	1 114.8	1 104.1	1 155.4	904.7	577.2	860.2

Total energy use structure, by percent



Climate Change Related Indicators from SEEA Energy Accounts

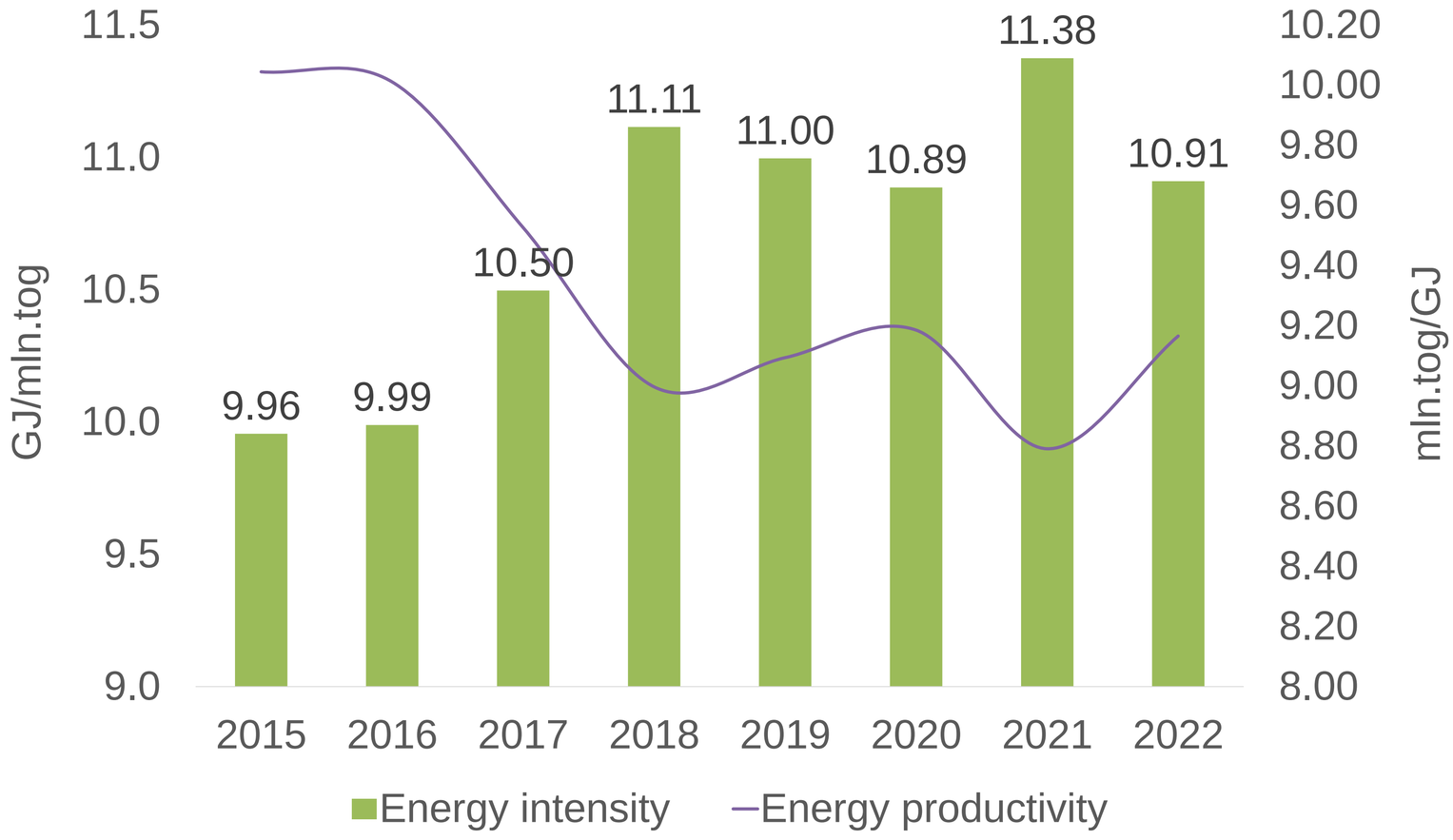
1b. Total primary energy supply, thous.TJ

1b. Total primary energy supply, thous.TJ, by source, 2022

	Total primary energy supply, thous.TJ	Share to total
Energy from natural inputs	992.3	100.00
Fossil non-renewable natural energy inputs	960.8	96.83
Hydro based renewable natural energy inputs	0.2	0.02
Wind based renewable natural energy inputs	1.8	0.18
Solar based renewable natural energy inputs	0.9	0.09
Biomass based renewable natural energy inputs	28.5	2.87

Climate Change Related Indicators from SEEA Energy Accounts

5a. Total energy intensity of production activities of the national economy



Energy intensity reflect a country's efficiency on energy use, which is calculated by comparing energy use to GDP in given period.

Climate Change Related Indicators from SEEA Energy Accounts

5a. Total energy intensity of production activities of the national economy, by industry

	2015	2016	2017	2018	2019	2020	2021	2022
Industries - total	**9.96**	**9.99**	**10.50**	**11.11**	**11.00**	**10.89**	**11.38**	**10.91**
Agriculture	0.21	0.21	0.24	0.25	0.26	0.27	0.26	0.23
Mining & quarrying	5.04	6.35	8.19	11.25	12.48	13.18	11.67	13.58
Manufacturing	7.89	8.34	7.02	6.22	6.93	6.25	7.83	7.11
Electricity	362.12	349.09	372.46	377.64	354.53	296.76	317.96	307.15
Water supply	8.27	8.20	6.59	7.19	10.75	12.67	13.01	11.09
Construction	6.95	6.95	6.31	7.26	6.74	5.36	8.58	8.69
Wholesale & retail trade	2.72	1.96	1.99	2.12	2.13	2.06	2.56	2.44
Transportation	6.41	6.46	6.77	6.80	7.40	9.05	8.59	9.41
Other services	1.98	1.89	1.80	1.72	1.75	3.31	2.00	1.93

For Mongolia, the most energy intensive industry is electricity, while the least energy intensive industries are agriculture and service sectors.

CHALLENGES

Main challenges in the compilation of SEEA

Quality of data, data availability

Inconsistent frequency and timing of data

Human resources to undertake future Accounts

Compilation of SEEA – not only statistician, specialist persons on environment issues, participation and cooperation are required.

FUTURE PLAN

MNSO compiled & improved the following accounts:

Regular

- Material Flow Accounts
- Energy PSUT
- Environment taxes accounts
- Water accounts

On-going

- Solid waste accounts
- Air emission accounts (energy-first approach)
- Agriculture accounts
- Environmental Protection Expenditure Accounts

Planning

- SEEA EA (translation in Mongolian language)
- Mineral resource accounts (availability of resources)

Forestry accounts

- Environmental subsidies, transfer accounts
- Environmental goods and service accounts

SEEA Data Dissemination to users:

Available only in mongolian

QUALITY REPORT

Quality reports for users: SEEA 10 accounts

METADATA

Statistical indicators with explanations

ANNUAL REPORTING

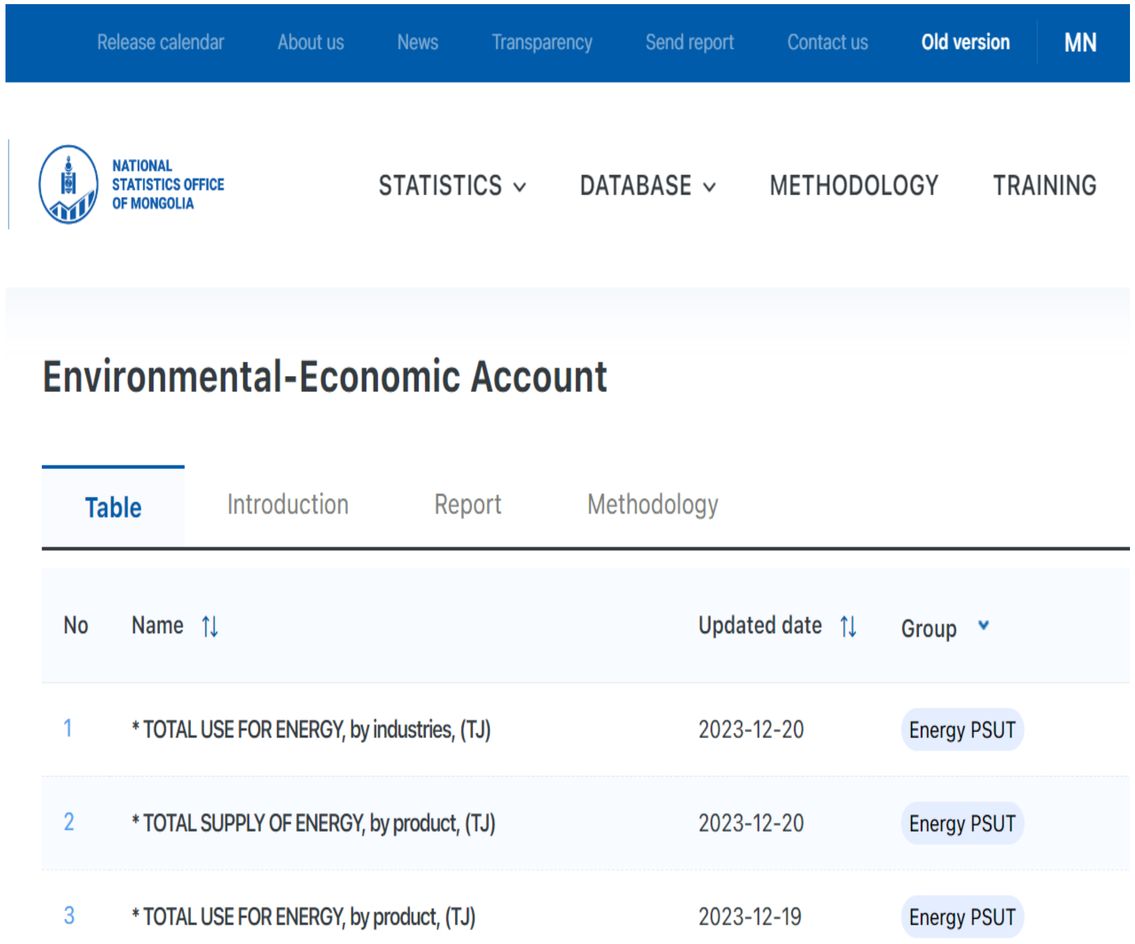
Annual report on 9 accounts (MFA, Env.tax, Agri, Waste, Water,)

GLOSSARY & DEFINITION

Detailed explanation of statistical terminology

METHODOLOGY, GUIDELINES

SEEA CF-2012, related methodology & handbook on compilation of accounts



Tables /indicators available in english & mongolian

ҮНДЭСНИЙ
СТАТИСТИКИЙН
ХОРОО

THANK YOU FOR YOUR ATTENTION

WWW.NSO.MN | WWW.1212.MN