

# Environmental Protection Expenditure Accounts Definitions and Classifications

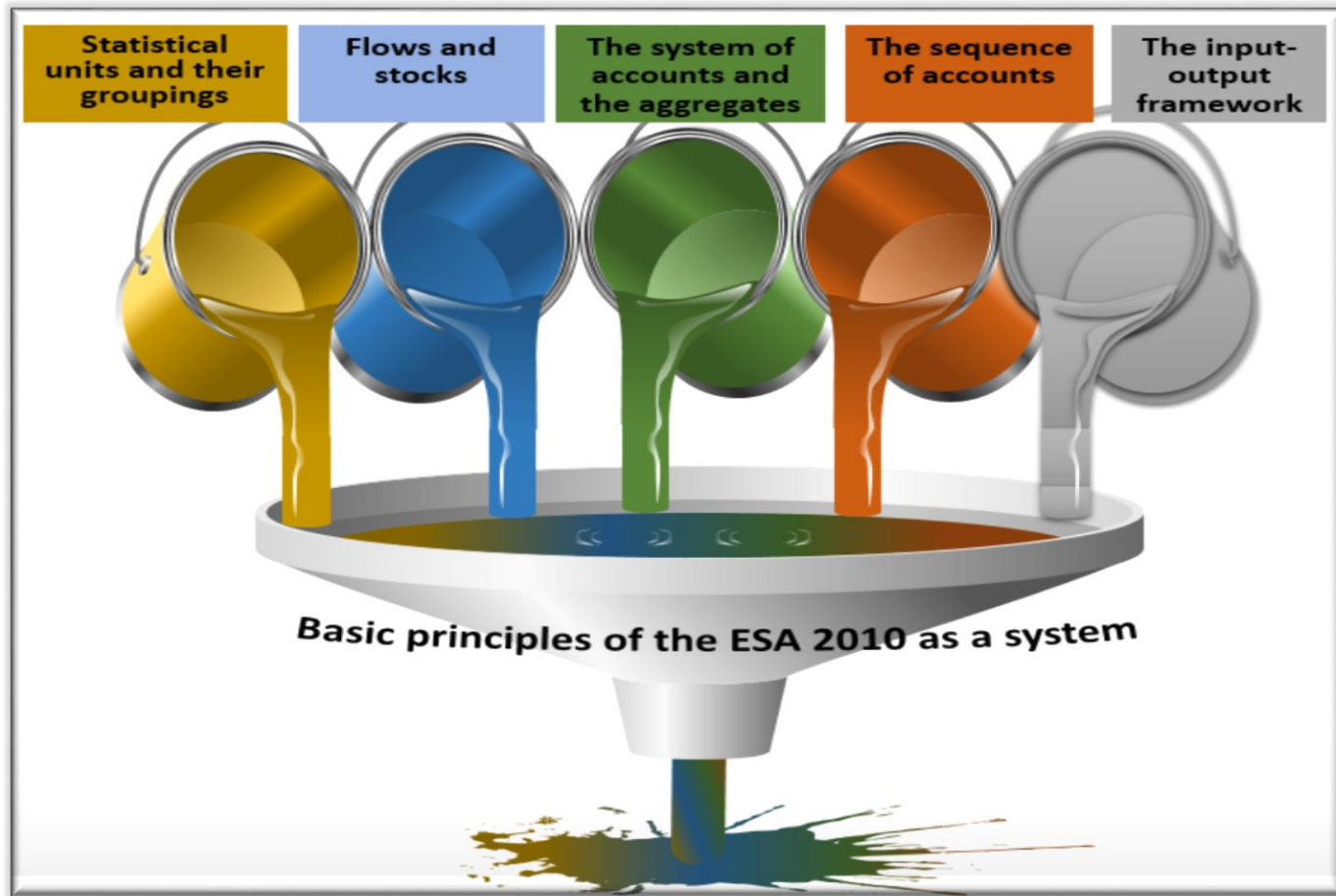
03–05 December 2018, Azərbaycan

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# Outline

- National accounts concepts used in environmental accounts
- Classification of Environmental Protection Activities (CEPA)
- Classification of Resource Management Activities (CReMA)
- CEPA-CReMA borderline cases
- Statistical units
- Goals of EPEA

# National accounts concepts used in environmental accounts



# National accounts concepts used in environmental accounts

## Institutional units and sectors

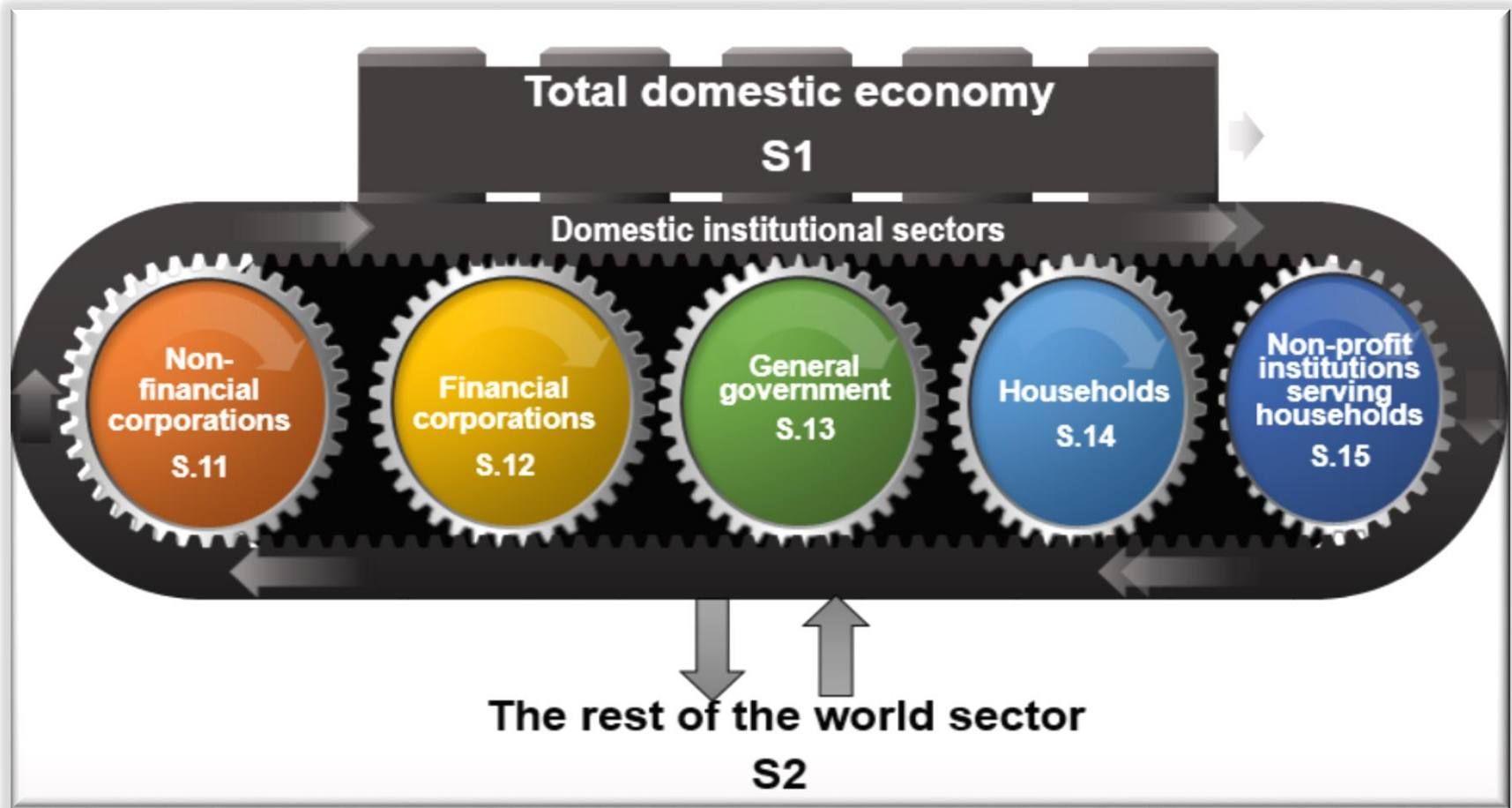
“Economic entities that are capable of owning goods and assets, of incurring liabilities and of engaging in economic activities and transactions with other units in their own right”



## Local KAUs and industries

“When institutional units carry out more than one activity, they shall be partitioned with regard to the type of activity. Local KAUs enable this presentation to be made.”

# National accounts concepts used in environmental accounts



# National accounts concepts used in environmental accounts



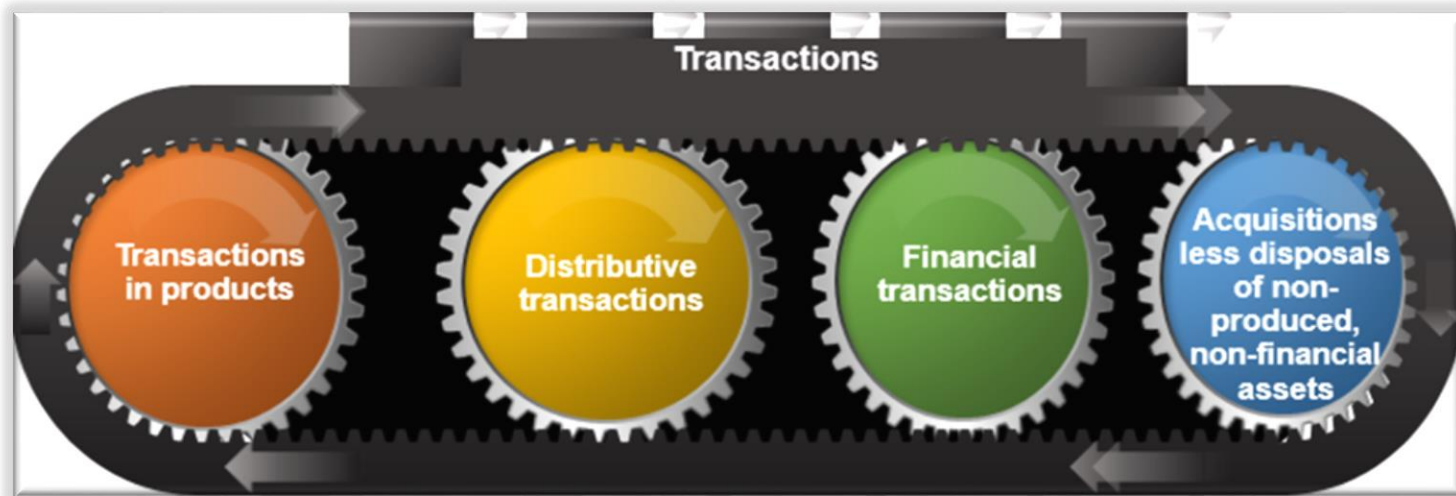
## Flows refer to:

- actions and effects of events that take place within a given period of time
- creation, transformation, exchange, transfer or extinction of economic value
- changes in the value of an institutional unit's assets or liabilities

# National accounts concepts used in environmental accounts

## Flows are of two kinds:

1. Transactions - an economic flow that is an interaction between institutional units by mutual agreement or an action within an institutional unit that it is useful to treat as a transaction
2. Other changes in assets – not relevant for MEA



# National accounts concepts used in environmental accounts



Transaction categories	Code
Output	P.1
Intermediate consumption	P.2
Final consumption expenditure	P.3
Actual final consumption	P.4
Gross capital formation	P.5
Exports of goods and services	P.6
Imports of goods and services	P.7

Transaction category	Code
Compensation of employees	D.1
Taxes on production and imports	D.2
Subsidies	D.3
Property income	D.4
Current taxes on income, wealth, etc.	D.5
Social contributions and benefits	D.6
Other current transfers	D.7
Adjustment for the change in <u>pension</u> entitlements	D.8
Capital transfers	D.9
Employee stock options	ESOs



# National accounts concepts used in environmental accounts

## Stocks refer to:

- positions at a point of time
- holdings of assets and liabilities at a point in time
- recorded at the beginning and end of each accounting period
- accounts that show stocks are called balance sheets.



# National accounts concepts used in environmental accounts

## Double-entry accounting

- Applied in respect of a single economic unit
- Requires that for each transaction there are two entries
  - one for output, consumption, investment, property income or transfer
  - a corresponding showing the increase or decrease in financial assets or liabilities
- E.g. the purchase of fish by a household - reflected as both an increase in consumption and a decrease in cash

## Quadruple-entry accounting

- The double entry accounting extended for all units in the economy
- E.g. the example above also entails a decrease in inventory and an increase in cash for the fishing business.



# National accounts concepts used in environmental accounts

## Time of recording - in monetary accounts - accrual approach

- transactions are recorded when ownership changes and the corresponding claims and obligations arise, or are transformed or cancelled
- transactions internal to one unit are recorded when economic value is created, transformed or extinguished



## Units of measurement

- For monetary accounts, all entries in the accounts must be measured in terms of money and therefore the components from which the entries are built up must be measured in terms of money

# National accounts concepts used in environmental accounts

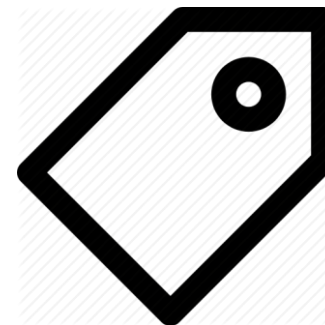
## Valuation rules and principles:

### Valuation at market prices:

- the ESA's reference for valuation
- market prices for transactions are defined as amounts of money that willing buyers pay to acquire something from willing sellers
- in the environmental accounts, valuation principles are applied slightly more broadly than in the ESA as the EA includes a wider range of intra-enterprise flows, in particular own-account production used for intermediate consumption by market producers

# National accounts concepts used in environmental accounts

Basic prices
<i>plus</i>
Taxes on products excluding invoiced VAT
<i>less</i>
Subsidies on products
<i>equal</i>
Producers' prices
<i>plus</i>
VAT not deductible by the purchaser
<i>plus</i>
Separately invoiced transport charges
<i>plus</i>
Wholesalers' and retailers' margins
<i>equal</i>
Purchasers' prices



# National accounts concepts used in environmental accounts

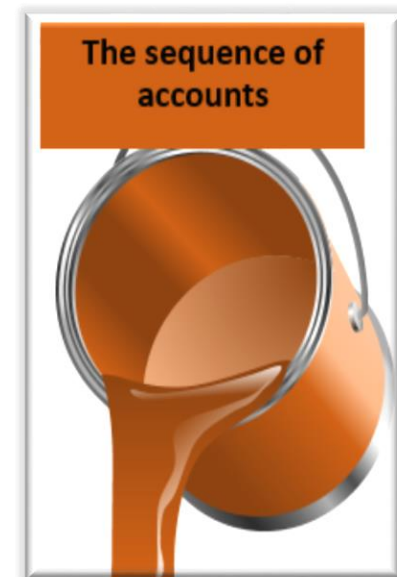
For estimates compiled in monetary terms, the changes over time in the values of goods and services can be decomposed into two components:

- changes in prices
- changes in volumes

**Consolidation** - refers to the elimination, from both uses and resources, of transactions that occur between units when units are grouped, and to the elimination of reciprocal financial assets and liabilities. This occurs commonly when the accounts of subsectors of general government are combined

# National accounts concepts used in environmental accounts

- **Supply - use tables** - record most of the information of the interactions between the economy and the environment
- But, **sequence of accounts** – record other transactions (e.g. payments of environmental taxes and subsidies, grants from government units ) that are of interest
- Sequence of economic accounts in the SEEA - follows the broad structure of the sequence of accounts in the SNA (ESA 2010 compatible)
- Particular feature - the presentation of balancing items (e.g. value added, operating surplus)



# National accounts concepts used in environmental accounts



**Core of the input-output framework = supply-use tables** in current prices and prices of the previous year

**Monetary supply and use tables** - record all flows of products in an economy between different economic units in monetary terms



# Classification of Environmental Protection Activities (CEPA)

## **CEPA: Classification of Environmental Protection Activities**

- Environmental protection: Air, wastewater, waste, noise, ++

## **CRema: Classification of Resource Management Activities**

- Management of resources: Water, forest, flora, fauna, energy from renewable sources, ++

# Classification of Environmental Protection Activities (CEPA)

## CEPA 2000;

- generic,
- multi-purpose,

CEPA is designed to classify transactions and activities whose primary purpose is environmental protection.

functional classification for environmental protection. It is used for classifying activities but also products, actual outlays (expenditure) and other transactions.



The management of natural resources (e.g., water supply) and the prevention of natural hazards (landslides, floods, etc.) are not included in CEPA.

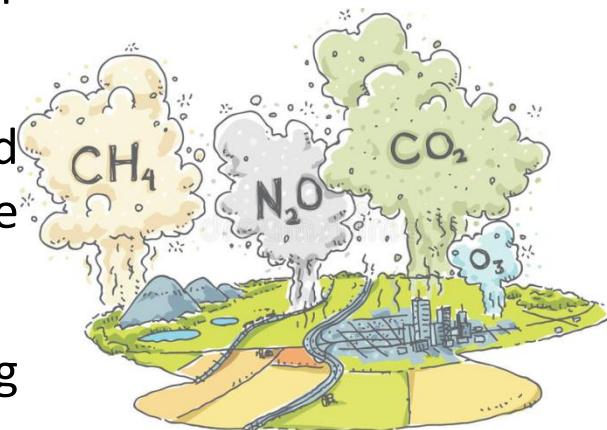
# Classification of Environmental Protection Activities (CEPA)

## 1 PROTECTION OF AMBIENT AIR AND CLIMATE

Protection of ambient air and climate comprises

- Reduction of emissions into the ambient air or ambient concentrations of air pollutants
- Control of emissions of greenhouse gases and gases that adversely affect the stratospheric ozone layer.

Excluded are measures undertaken for cost saving reasons (e.g. energy saving).



# Classification of Environmental Protection Activities (CEPA)

## 2 WASTEWATER MANAGEMENT

Wastewater management comprises

- Prevention of pollution of surface water through the reduction of the release of wastewater into inland surface water and seawater.
- It includes the collection and treatment of wastewater including monitoring and regulation activities.
- Septic tanks are also included.



Excluded are actions and activities aimed at the protection of groundwater from pollutant infiltration and the cleaning up of water bodies after pollution (see CEPA 4).

# Classification of Environmental Protection Activities (CEPA)

## 3 WASTE MANAGEMENT

Waste management refers to

- Prevention of the generation of waste and the reduction of its harmful effect on the environment.
- Includes the collection and treatment of waste, including monitoring and regulation activities.
- It also includes recycling and composting, the collection and treatment of low level radioactive waste, street cleaning and the collection of public litter.



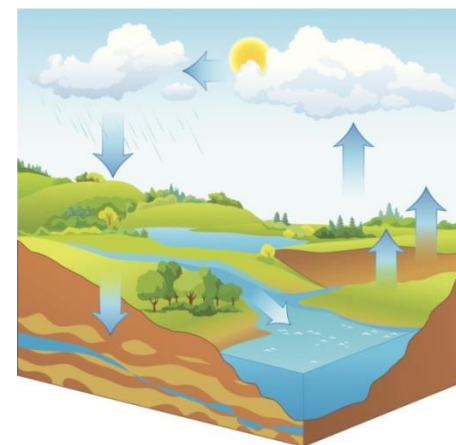
# Classification of Environmental Protection Activities (CEPA)

## 4 PROTECTION AND REMEDIATION OF SOIL, GROUNDWATER AND SURFACE WATER

Protection and remediation of soil, groundwater and surface water refers to

- Prevention of pollutant infiltration, cleaning up of soils and water bodies and the protection of soil from erosion and other physical degradation as well as from salinization.
- Monitoring, control of soil and groundwater pollution is included.

Excluded are wastewater management activities (see CEPA 2), as well as activities aimed at the protection of biodiversity and landscape (see CEPA 6).

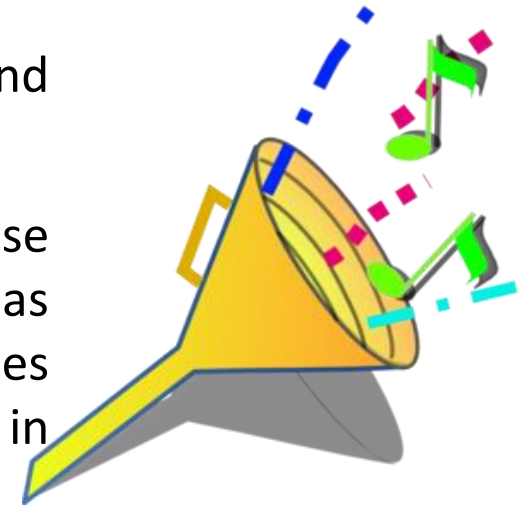


# Classification of Environmental Protection Activities (CEPA)

## 5 NOISE AND VIBRATION ABATEMENT

Noise and vibration abatement refers to

- Control, reduction and abatement of industrial and transport noise and vibration.
- Activities for the abatement of neighborhood noise (soundproofing of dancing halls, etc.) as well as activities for the abatement of noise in places frequented by the public (swimming pools, etc.), in schools, etc., are included.



Excluded is the abatement of noise and vibration for purposes of protection at the workplace.

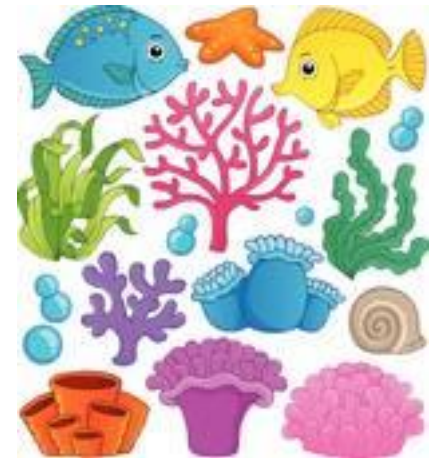
# Classification of Environmental Protection Activities (CEPA)

## 6 PROTECTION OF BIODIVERSITY AND LANDSCAPES

Protection of biodiversity and landscape refers to

- Protection and rehabilitation of fauna and flora species, ecosystems and habitats as well as the protection and rehabilitation of natural and semi-natural landscapes.

Excluded is the protection and rehabilitation of historic monuments or predominantly built-up landscapes, the control of weed for agricultural purposes. The establishment and maintenance of green spaces along roads and recreational structures (e.g. golf courses, other sports facilities) are also excluded.





# Classification of Environmental Protection Activities (CEPA)

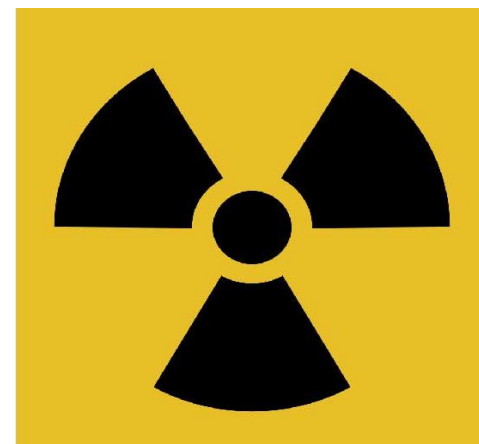
## 7 PROTECTION AGAINST RADIATION

Protection against radiation refers to

- Reduction or elimination of the negative consequences of radiation emitted from any source.
- Included is the handling, transportation and treatment of high level radioactive waste,

Excluded are

- Prevention of technological hazards (e.g. external safety of nuclear power plants), as well as protection measures taken at workplaces.
- Collection and treatment of low-level radioactive waste (see CEPA 3).

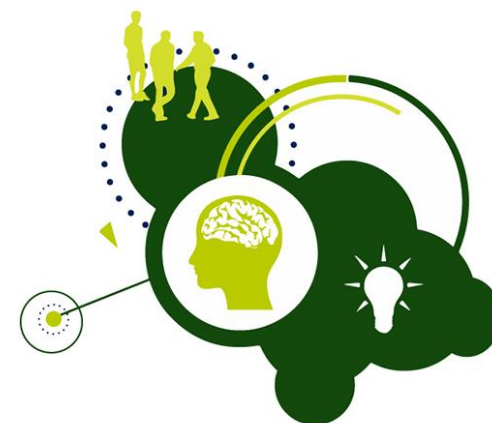


# Classification of Environmental Protection Activities (CEPA)

## 8 RESEARCH AND DEVELOPMENT

The class regroups all R&D activities and expenditure oriented towards environmental protection: identification and analysis of sources of pollution, mechanisms of dispersion of pollutants in the environment as well as their effects on human beings, the species and the biosphere.

Excluded are R&D activities related to the management of natural resources.

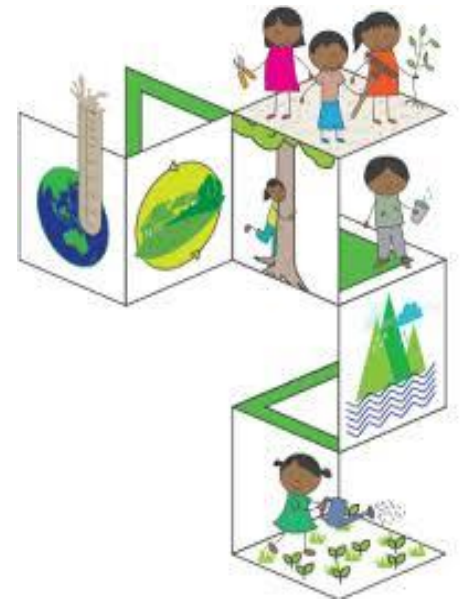


# Classification of Environmental Protection Activities (CEPA)

## 9 OTHER ENVIRONMENTAL PROTECTION ACTIVITIES

Other environmental protection activities refers to

- all environmental protection activities which take the form of general environmental administration and management activities,
- training or teaching activities specifically oriented towards environmental protection which consist of public information, when they are not classified elsewhere in CEPA.
- It also includes activities leading to indivisible expenditure, as well as activities not elsewhere classified.



# Classification of Resource Management Activities (CReMA)

- Resource management includes all actions and activities that are aimed at preserving and maintaining the stock of natural resources and hence safeguarding against depletion.
- This includes actions and activities aimed at reducing the withdrawals of natural resources (recovery, reuse, recycling, substitution of natural resources) as well as restoring natural resource stocks (increases/recharges of natural resource stocks).

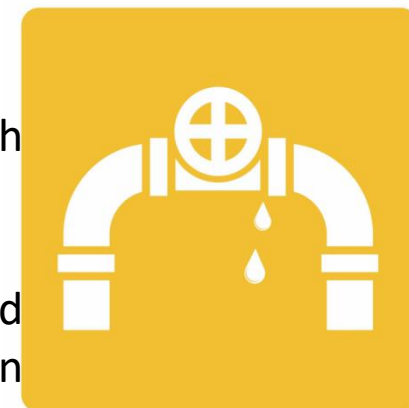


# Classification of Resource Management Activities (CReMA)

## 10 MANAGEMENT OF WATER

Management of water comprises

- Minimization of inland waters intake through inprocess modifications,
- The reduction of water losses and leaks,
- Reduction of the intake by substituting the resource with alternative resources,
- Water reuse and savings,
- Restoration, measurement, control, laboratories and the like and education, training and information and general administration activities



Activities related with the maintenance of the quality of water bodies are excluded (see CEPA 4). Collection, treatment and distribution of water should be in principle excluded.

# Classification of Resource Management Activities (CReMA)

## 11 MANAGEMENT OF FOREST RESOURCES

The management of forest resources as natural resources should in theory only deal with non-cultivated forest areas and related timber stocks,

i.e. forests areas not available for wood supply (either because they are protected or because the harvest is uneconomic due to the low productivity or to high harvesting and transport cost) and natural forest areas and corresponding timber.



# Classification of Resource Management Activities (CReMA)

## 12 MANAGEMENT OF WILD FLORA AND FAUNA

Management of wild flora and fauna comprises

- Minimisation of the intake of wild flora and fauna (wild growing forest products are excluded) through in-process modifications
- Restoration activities
- Measurement, control, laboratories
- Education, training and information and general administration activities linked to the management of wild flora and fauna.





# Classification of Resource Management Activities (CReMA)

## 13 MANAGEMENT OF ENERGY RESOURCES

Management of energy resources comprises

- Minimisation of the intake of fossil resources through the production of energy from renewable sources,
- Heat/energy saving and management
- The minimisation of the intake of fossil resources for raw materials for uses other than energy production.



Exploitation, management and maintenance of the stocks of non-renewable energy sources (including exploration and discovery of new reserves) are not included.



Also excluded are measures that improve the efficiency of energy resources extraction.



# Classification of Resource Management Activities (CReMA)

## 14 MANAGEMENT OF MINERALS

Management of minerals comprises

- Minimisation of the intake of minerals through inprocess
- Modifications
- Reduction of scraps and the production of minerals secondary raw materials.
- Measurement, control, laboratories
- Education, training and information and general administration activities linked to the management of minerals.

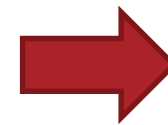


# Classification of Resource Management Activities (CReMA)

## 14 MANAGEMENT OF MINERALS

Recovery of mineral based materials: processing of metallic and non-metallic mineral materials waste and scrap and other articles into secondary raw materials.

- mechanical crushing of metal waste from used cars, etc.
- mechanical reduction of large iron pieces such as railway wagons
- shredding of metal waste, end-of-life vehicles etc.
- other methods of mechanical treatment as cutting, pressing to reduce the volume
- reclaiming metals out of photographic waste
- crushing, cleaning and sorting of glass
- crushing, cleaning and sorting of other waste such as demolition waste to obtain secondary raw material



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# Classification of Resource Management Activities (CReMA)

## 15 RESEARCH AND DEVELOPMENT ACTIVITIES FOR RESOURCE MANAGEMENT

Research and development activities for natural resource management comprises

- creative work undertaken on a systematic basis in order to increase the stock of knowledge and the use of this knowledge to devise new applications in the field of natural resource management and savings: R&D for
  - renewable energy,
  - for energy and minerals savings,
  - for timber
  - other biological resources savings, etc.



# Classification of Resource Management Activities (CReMA)

## 16 OTHER RESOURCE MANAGEMENT ACTIVITIES

Natural resource management activities

- Not classified in the previous classes,
- General administration,
- Education, training and information
- Other kinds of activities leading to indivisible output.

## CEPA-CReMA borderline cases

### CEPA 1/CREMA 13

#### **Cleaner versus more resource efficient transport and other equipment**

As concerns cleaner and more resource efficient transport and other equipment, it may be difficult to determine whether the equipment is cleaner, because it reduces emissions of air pollutants or noise or is more resource efficient because it reduces consumption of energy.



## CEPA-CReMA borderline cases

### CEPA 1/CREMA 13

If the equipment is specifically designed for reducing air and noise emissions (e.g. hybrid or electric cars) its production should be recorded under environmental protection as a cleaner product.



In this case, if it is not possible to identify **CEPA 5** (noise and vibration abatement) as main purpose, it should be allocated to **CEPA 1**.

If the equipment reduces the emission of air pollutants because it is designed to use less energy it should be recorded under resource management and therefore be classified under **CReMA 13**.



## CEPA-CReMA borderline cases

### CEPA 2/CREMA 13 – CREMA 14

#### Sewage sludge

- Sewage sludge is a by-product of wastewater treatment; its CPA code is 37.00.20.
- When used as fertilizer in agriculture, sewage sludge may save mineral resources as the nutrients contained in the sludge can substitute nutrients from mineral fertilizers and also save energy that would be used to produce the mineral fertilizers.
- Sludge may also be an input to biogas production.

## CEPA-CReMA borderline cases

### CEPA 2/CREMA 13 – CREMA 14

- The processing of sewage sludge before its use in agriculture (e.g. decontamination, special processing to increase the nutrient availability for crops) is to be recorded as resource management activity under **CReMA 13** or **CREMA 14** if it can be demonstrated that the value of the processed sludge (either sold or for own use) covers more than 90% of the processing costs on a multiannual average.
- In all other cases the value of processed (or unprocessed) sewage sludge (either sold or for own use) should be recorded under **CEPA 2** as by-product.





## CEPA-CReMA borderline cases

### CEPA 3/CREMA 11 - CREMA 13 - CREMA 14

There are some waste treatment activities whose by-products contribute to the reduction of resource use. Such activities are

- Incineration of waste,
- Composting
- Production of biogas
- Materials recovery



## CEPA-CReMA borderline cases

### CEPA 3/CREMA 11 - CREMA 13 - CREMA 14

- Should be recorded as a resource management activity and classified under the **CReMA 11, 13, or 14** if laws or programs (public or private) governing these activities mention resource management as their single main objective,
- May be recorded as resource management activities and classified under the CReMA activities if it can be demonstrated that the value of the recovered materials or compost (either sold or for own use) covers more than 90% of the costs of these activities on a multiannual average,
- Are to be recorded under **CEPA 3** in all other cases.



## CEPA-CReMA borderline cases

### CEPA 5 / CREMA 13

Some activities can serve both, noise abatement and heat and energy saving.

- Only if noise abatement is the main purpose these activities should be recorded under **CEPA 5**.
- As an operational rule these activities are classified in CEPA 5 only if the environmental laws or environmental programs (public or private) governing these activities mention noise abatement as their single main objective. In all other cases they should be recorded as resource management activities classified under the **CReMA 13**



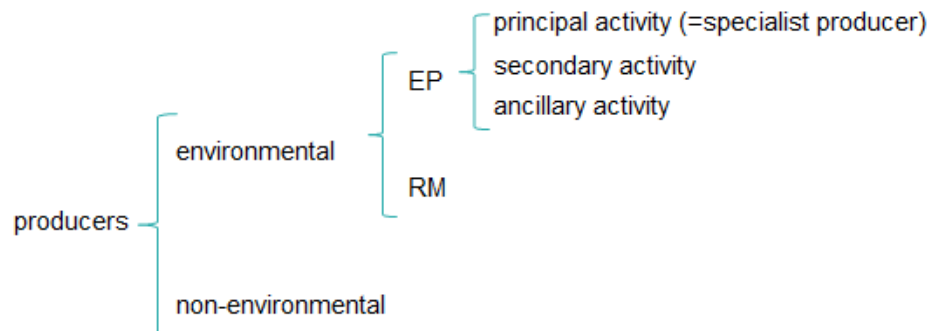
## Statistical units

- EPEA use statistical units from national accounts. National accounts define and use various statistical units and groupings of units that interact economically
- The most central unit used in national accounts is the so-called institutional unit which is defined as “**an economic entity characterized by decision-making autonomy**”
- The institutional sectors in ESA 2010 are
  - non-financial corporations,
  - financial corporations,
  - general government,
  - non-profit institutions serving households,
  - households,
  - the rest of the world.

## Statistical units

Producer units can engage in the production of EP services as part of their principal, secondary or ancillary.

- **Specialist EP producers** are local KAU whose primary activity is the production of EP services.
- **EP secondary producers** are local KAU which produce EP services as secondary activity.
- **Ancillary EP producers** are local KAU which produce EP services as ancillary activity; otherwise said: they do not sell their EP production to other economic units but consume the outputs themselves



# Statistical units

## Industries

- Local KAUs engaged in the same or similar kind-of-activity can be grouped into industries.
- Local KAUs and industries are suited to analyse production processes and technico economic relationships.
- Industries are classified according to the Statistical Classification of Economic Activities in the European Community, NACE Rev. 2

## Goals of EPEA

The purpose of environmental protection expenditure accounts is to **enable identification and measurement of society's response to environmental concerns through the supply of and demand for environmental protection services and through the production and consumption behavior aimed at preventing environmental degradation.**

The purpose of the EPEA is,

- how much does a nation spend on environmental protection and what form does this expenditure take? (determination of the national expenditure on environmental protection)
- how and by which units is this expenditure financed? (analysis of the financing of national expenditure)
- which economic activities are induced by environmental protection? (analysis of the output of environmental protection services).



**Təşəkkür edirəm**