

Environmental activity accounts

Expenditures, taxes and EGSS



System of
Environmental
Economic
Accounting

<http://www.unescap.org/our-work/statistics>

Outline

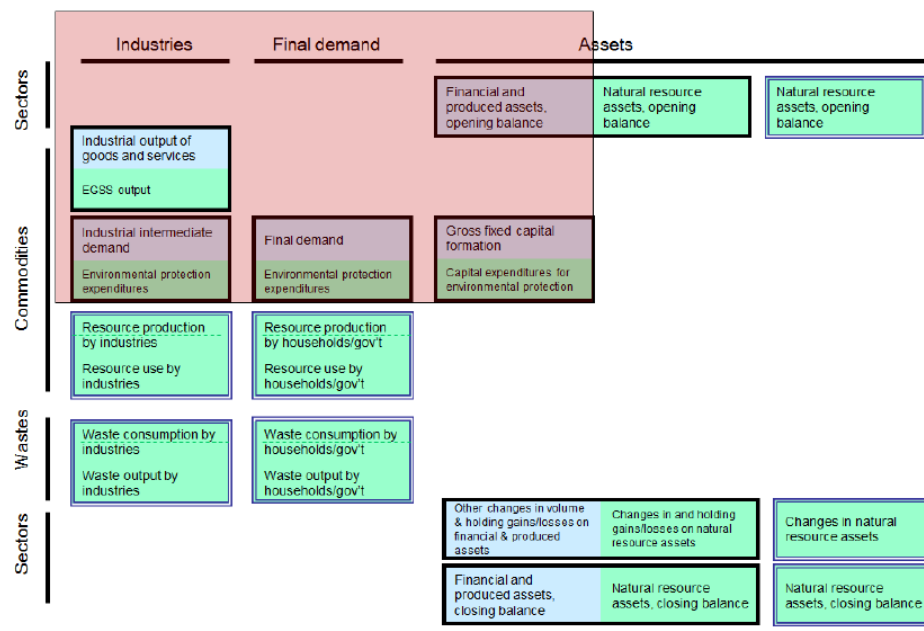
- What are environmental activity accounts? (30min)
 - Protection expenditures
 - Goods and services
 - Taxes and subsidies
- Group exercise (15min)
- Questions and discussion (15min)



Learning objectives

- What Environmental Activity Accounts are and why they are important
- The basic concepts
- How they are treated in the SEEA
- Country examples
- Data sources and measurement challenges

Environmental Activity Accounts



Environment accounts and statistics

SEEA-CF (Central Framework)	<ul style="list-style-type: none"> • Assets • Physical flows • Monetary flows 	<ul style="list-style-type: none"> • Minerals & Energy, Land, Timber, Soil, Water, Aquatic, Other Biological • Materials, Energy, Water, Emissions, Effluents, Wastes • Protection expenditures, taxes & subsidies
SEEA Water; SEEA Energy; SEEA Agriculture, Forestry and Fisheries	Add sector detail	As above for <ul style="list-style-type: none"> • Water • Energy • Agricultural, Forestry and Fisheries
SEEA-EEA (Experimental Ecosystem Accounting)	Adds spatial detail and ecosystem perspective	Extent, Condition, Ecosystem Services, Carbon, Water, Biodiversity
FDES (Framework for the Development of Environment Statistics)	Basic statistics for above plus...	<ul style="list-style-type: none"> • Extreme events and disasters • Human settlements and health • Protection, management & engagement

Scope of environmental activities

- SEEA-CF 4.11...*economic activities whose **primary purpose** is to reduce or eliminate pressures on the environment or to make more efficient use of natural resources.*
 - Environmental restoration, conservation
 - Resource management
 - Technologies to reduce impacts
 - Taxes, subsidies and permits
- How to decide on **primary purpose**?



Which are environmental activities?

- Installing solar panels
- Buying equipment to measure pollution
- Buying an apartment in an area with less pollution
- Buying mercury-free batteries
- Buying guns to shoot rabbits
- Installing low-flow shower
- Taxing fuel
- Taxing carbon emissions

• Remember: **Primary purpose** criterion?



Environmental Activities in SEEA-CF

Supply	Use	From → To
Environmental Goods and Services Sector (EGSS)	Environmental protection expenditure accounts (EPEA)	All → All (Government, companies, households, NPISH)
Environmental subsidies and similar transfers		Government → All
	Environmental taxes & permits	All → Government

What is NPISH? Can you pronounce it?



Uses

- Implied in 9 SDGs
 - How much are we spending?
 - Who provides?
 - How financed?
- Assessing benefits/costs
- Allocating funds
- Tax or cap?
(price vs quantity)



EPE Accounts

Table 4.1

Classification of Environmental Activities: overview of groups and classes

Group	Classes
I: Environmental protection (EP)	1 Protection of ambient air and climate
	2 Wastewater management
	3 Waste management
	4 Protection and remediation of soil, groundwater and surface water
	5 Noise and vibration abatement (excluding workplace protection)
	6 Protection of biodiversity and landscapes
	7 Protection against radiation (excluding external safety)
	8 Research and development for environmental protection
	9 Other environmental protection activities
II: Resource management (RM)	10 Management of mineral and energy resources
	11 Management of timber resources
	12 Management of aquatic resources
	13 Management of other biological resources (excluding timber and aquatic resources)
	14 Management of water resources
	15 Research and development activities for resource management
	16 Other resource management activities

Why exclusions?

EPE Accounts

- Environmental protection and expenditure accounts
 - Payments (\$) from user to supplier
 - Some information on “supply” from user, but incomplete (→ EGSS to get complete picture)
 - SEEA-CF 4.45 *...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 adoption of production and consumption behaviour aimed at preventing environmental degradation.***

EPE Accounts

- Table 4.2 Production of environmental protection specific services (\$)
 - Producers by type
- Table 4.3 Supply and use of environmental protection specific services (\$)
 - Specific services, taxes - subsidies
- Table 4.4 Total national expenditure on environmental protection (\$)
 - Who pays (by type; includes connected and adapted)
- Table 4.5 Financing of national expenditure on environmental protection (\$)
 - Who pays whom?

Table 4.2
Production of environmental protection specific services (currency units)

	Producers				Total
	Specialist producers			Own-account producers	
	Government producers	Other specialist producers	Non-specialist producers		
Output of environmental protection specific services	3 000	6 500	2 400	1 600	13 500
Intermediate consumption	2 000	3 000	600	400	6 000
Environmental protection specific services	1 800	1 500	500	300	4 100
Other goods and services	200	1 500	100	100	1 900
Gross value added	1 000	3 500	1 800	1 200	7 500
Compensation of employees	600	2 000	1 200	800	4 600
Taxes less subsidies on production					
Consumption of fixed capital	400	1 000	600	400	2 400
Net operating surplus		500			500
Supplementary items					
Labour input (hours worked)	4 000	10 000	4 500	4 000	22 500
Gross fixed capital formation	1 100	1 000	2 000	500	4 600
Acquisition less disposals of non-produced, non-financial assets		200			

Table 4.3
Supply and use of environmental protection specific services (currency units)

Supply table

	Output at basic prices	Taxes less subsidies on products	Trade and transport margins	Output at purchasers' prices	Imports	Total supply
Environmental protection specific services	13 500	270		13 770		13 770

Use table

	Intermediate consumption		Final consumption		Gross fixed capital formation	Exports	Total use
	Specialist producers	Other producers	Households	Government			
Environmental protection specific services	1 500	7 400	2 970	1 800	100		13 770

Table 4.4
Total national expenditure on environmental protection (currency units)

Type of expenditure by product	Users						Total
	Industry			Households	General government	NPISH ^a	
	Specialist producers	Producers of environmental protection specific services	Non-specialist and own-account producers				
Environmental protection specific services							
Intermediate consumption	NI	4 000	3 400				7 400
Final consumption				2 970	1 800		4 770
Gross fixed capital formation	NI		100				100
Connected products							
Intermediate consumption	NI		200				200
Final consumption							
Gross fixed capital formation	NI						
Adapted goods							
Intermediate consumption	NI						
Final consumption				600			600
Gross fixed capital formation	NI						
Capital formation for characteristic activities	2 100	2 500					4 600
Transfers for environmental protection not included above							
Environmental protection transfers to and from the rest of the world (net)					200		200
Total national expenditure on environmental protection	2 100	6 500	3 700	3 570	2 000		17 870

Note: Dark grey cells are null by definition.

*NI means "not included in the derivation of total national expenditure on environmental protection".

^a Non-profit Institutions serving households.

Table 4.5
Financing of national expenditure on environmental protection (currency units)

Financing units	Users						Total
	Producers of environmental protection specific services			Households	Government	NPISH ^a	
	Specialist producers	Non-specialist and own-account producers	Other producers				
Government	1 300	1 100			1 700	300	4 400
Corporations							
Specialist producers	800	5 400					6 200
Other producers			3 700				3 700
Households				3 570			3 570
National expenditure	2 100	6 500	3 700	3 570	1 700	300	17 870
Rest of the world					100		100
Total uses of resident units	2 100	6 500	3 700	3 570	1 800	300	17 970

^a Non-profit Institutions serving households.



EPE Accounts

- Data sources
 - SNA for aggregates & benchmark
 - More detail
 - Government expenditure accounts
 - Balance of payments/trade
 - Focussed survey of EPE



EPE Accounts

- **Canada: Bi-annual industry Survey of Environmental Protection Expenditures (SEPE)**

The Daily		
In the news	Indicators	Releases by subject
Special interest	Release schedule	Information

Environmental protection expenditures by businesses, 2012

[Text](#)
[CANSIM tables](#)
[Related information](#)
[Previous release](#)
[PDF \(128 KB\)](#)

Released: 2015-04-29

Canadian businesses reported that they spent \$10.9 billion on environmental protection in 2012, up 15% from 2010.

Two categories of expenditures—pollution abatement and control processes, and waste management and sewerage services—accounted for just over half the total.

The oil and gas extraction industry reported spending \$4.7 billion or 43% of total business environmental protection expenditures. This was the most among the 16 industry groups surveyed. The mining and quarrying industry followed, spending \$1.4 billion or 12% of total expenditures, while the electric power generation, transmission and distribution industry spent just over \$1.3 billion in 2012.



EPE Accounts

- **Canada: Survey of Environmental Protection Expenditures (SEPE)**

- 3,500 respondents (20+ employees)
- Capital & operating expenditures
 - “*spending made in response to current or anticipated regulations, conventions or voluntary agreements*”
- Spending on renewable energy and on greenhouse gas emission mitigation
 - All expenditures (including voluntary)



EPE Accounts

INEGI Mexico “Green” GDP

- Depletion costs
 - Hydrocarbons
 - Forest resources
 - Groundwater
- Degradation costs
 - Soil
 - Solid waste treatment expenditures
 - Water pollution expend.
 - Air pollution expend.
- 8.5% of GDP in 2003
- 6.3% in 2012
- National plan → 4.5% by 2018

COSTOS TOTALES POR AGOTAMIENTO Y DEGRADACIÓN AMBIENTAL, 2012
(MILLONES DE PESOS)

Concepto	Costos por agotamiento y degradación ambiental	Porcentajes respecto al PIB
Costos Totales	985,064	6.3
Costos por Agotamiento	261,620	1.7
Agotamiento de hidrocarburos	217,968	1.4
Agotamiento de recursos forestales	14,174	0.1
Agotamiento del agua subterránea	29,478	0.2
Costos por Degradación	723,444	4.6
Degradación del suelo	74,564	0.5
Residuos sólidos	51,569	0.3
Contaminación del agua	64,632	0.4
Contaminación atmosférica	532,679	3.4

Fuente: INEGI.

Possibilities for mis-interpretation?

EPE Accounts

- **Challenges**
 - Small sample → limit detail released
 - Harmonizing government & private expenditures

EGSS





- **Environmental Goods and Services Sector**
 - Supply side of environmental activities
= production of environmental goods and services
- **Objective**
 - assess the contribution of EGSS to the total economy and employment
- **Indicators**
 - Production, “green” employment, value added, exports, gross investment

EGSS

- **Scope:**

- ...producers of all environmental goods and services
- ...all products...produced, designed and manufactured for environmental protection and resource management...
- Environmental specific services, connected products, adapted goods and technologies
- “**Primary purpose**” criterion (technical nature of product or activity / intention of the producer)

EGSS

 Sewage and refuse disposal	 Insulation
 Recycling	 Equipment
 Waste & scrap, recycled goods	 Consulting & engineering
 Renewable energy production	 Construction, inspection
 Sustainable energy systems	 Organic agriculture
	 Government, NGOs, education

Environmental Goods and Services

- **Methodology:**

- Product approach: Identify commodities → who produces?
- Activity approach: Identify industry → what do they produce?

- **Data sources:**

- Surveys (new or existing)
- SNA
- Industry statistics (Agriculture, recycling, energy...)
- Corporate Sustainability Reports (CSR)
- External reports

Environmental Goods and Services

- **Netherlands**

- Many environmental activities have been identified by Statistics Netherlands as EGSS activities
- For every activity a specific methodology has been developed to compile the data

- **Canada**

- Ongoing frame developed from existing surveys (EPE)
- Screening in other surveys (e.g., innovation, biotech)



Environmental Goods and Services

• *Netherlands* data sources

Activity	Main source
Sewage and refuse disposal services	National accounts, supply and use tables
Wholesale in waste and scrap	National accounts, supply and use tables
Environmental related inspection and control	Employment registers
Government governance related to the environment	Environmental Statistics, EPE statistics
Organisations and associations on the environment	Employment registers and business register
Internal environmental activities at companies	Environmental Statistics, EPE statistics
Renewable energy production	Energy Statistics, Renewable energy statistics
Energy saving and sustainable energy systems	Own constructed database and Production Statistics
Insulation activities	National accounts
Organic agriculture	Agriculture statistics, area of organic agriculture
Recycling	National accounts, supply and use tables
Second hand shops	Production Statistics
Water quantity control by waterboards	National accounts, Government accounts
Environmental advice, engineering and other services [†]	Own constructed database and Production Statistics
Industrial environmental equipment [†]	Own constructed database and Production Statistics
Environmental technical construction [†]	Own constructed database and Production Statistics
Environmental related education	Education statistics



Environmental Goods and Services

Canada Goods

Table 1
Revenues from sales of environmental goods manufactured in Canada, by type of good, 2012

[← Back to main article](#)

Select columns

	Manufactured in Canada ¹
	thousands of dollars
Total	1,770,279
Renewable energy production	603,338 ^A
Non-hazardous waste management	308,540 ^B
Industrial air pollution or flue gas management	167,360 ^B
Industrial wastewater and municipal sewage treatment	506,729 ^B
Remediation of ground and surface water, leachate, soil, sediment and sludge	184,312 ^B

- ^A excellent (0.00% to 4.99%)
- ^B very good (5.00% to 9.99%)
- ^C good (10.00% to 14.99%)
- ^D acceptable (15.00% to 24.99%)

Note(s): Figures may not add up to the total as a result of rounding. Estimates contained in this table have been assigned a letter value to indicate the quality of the estimate, as measured by the coefficient of variation (expressed as a percentage).

Source(s): Survey of Environmental Goods and Services (1209).

Environmental Goods and Services

Canada Services

Table 2
Revenues from sales of environmental services, by type of service and industry group, 2012

[← Back to main article](#)

Select columns

	Site remediation and emergency environmental services	Environmental consulting	Total
	thousands of dollars ¹	thousands of dollars ¹	thousands of dollars ¹
Total	756,804	1,536,405	2,293,209
Manufacturing and wholesale ²	86,380 ^B	...	86,380
Remediation ²	670,424 ^A	...	670,424
Environmental consulting services ³	..	1,536,405 ^A	1,536,405

.. not available for any reference period
 ... not applicable
 A excellent (0.00% to 4.99%)
 B very good (5.00% to 9.99%)

Note(s): Figures may not add up to totals as a result of rounding. Estimates contained in this table have been assigned a letter value to indicate the quality of the estimate, as measured by the coefficient of variation (expressed as a percentage).

Source(s): Survey of Environmental Goods and Services (1209).

Environmental Goods and Services

• Challenges

- Identifying primary purpose
 - “widget” could be for pollution reduction or creation
- Identifying target survey population
 - Many industrial sectors (manufacturing, consulting services...)
- International comparability
 - Scope
 - Methodology
 - Data sources
 - The more effort, the larger the EGSS?
- Cleaner goods / resource efficient goods = “green”?
- Integration in EPEA / ReMEA
- Dissemination of the results (confidentiality)

Environmental taxes

- ... *tax base is a physical unit of something that has a ... negative impact on the environment*
 - Energy taxes: Carbon, fuel, other
 - Transport taxes
 - Pollution taxes
 - Resource taxes Why resource consumption/depletion tax?
- Remember: *primary purpose* criterion

Environmental taxes

Table 4.9
Environmental taxes by type of tax

Type of environmental tax	Type of tax						Total
	Taxes on products	Other taxes on production	Taxes on income		Other current taxes	Capital taxes	
			Corporations	Households			
Energy taxes	10 800	1 500				300	12 600
Carbon taxes	4 600						4 600
Taxes on fuel used for transport	4 700						4 700
Other energy taxes	1 500	1 500				300	3 300
Transport taxes	2 600	800			1 400	100	4 900
Pollution taxes	400	500			200		1 100
Resource taxes	200	400			300		900
Total environmental taxes	14 000	3 200			1 900	400	19 500
Non-environmental taxes	79 000	15 400	23 000	74 000	5 800	1 600	198 800
Total taxes	93 000	18 600	23 000	74 000	7 700	2 000	218 300
<i>Share of environmental taxes (percentage)</i>	17.7	20.8	0.0	0.0	32.8	25.0	9.8



Environmental subsidies

- 4.138 ...transfer intended to support activities that protect the environment or reduce the use and extraction of natural resources...
 - subsidies, social benefits to households, investment grants and other current and capital transfers.



Environmental subsidies

Table 4.8
Selected payments to and from government and similar transactions

		Payments received by				
		Government	Corporations	Households	NPISH ^a	Rest of the world
Payments made by	Government	Transfers between levels of government	Subsidies and investment grants	Current and capital transfers	Subsidies; current and capital transfers	Current and capital transfers
	Corporations	Taxes, fines, fees, charges and rent	Rent	Rent	Donations	Donations to NPISH in rest of the world
	Households	Taxes, fees, charges and fines			Donations	Donations
	NPISH ^a	Taxes	Current and capital transfers	Current and capital transfers		Current and capital transfers
	Rest of the world	Taxes and current transfers			Donations	

^a Non-profit institutions serving households.

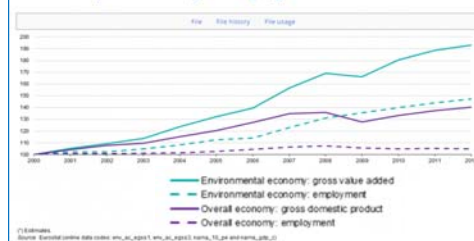
Environmental taxes & subsidies

- Data sources
 - SNA
 - Tax department
 - Surveys
- Country examples
 - EU

Environmental activities (EU)

- EGSS
- EPEA
- Taxes, transfers and subsidies

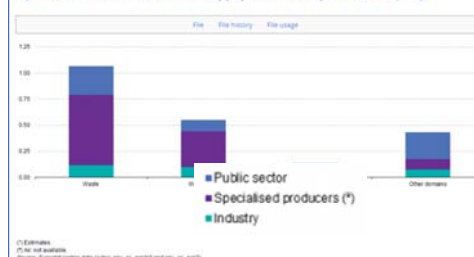
File:Development of key indicators for the environmental economy and the overall economy, EU-28, 2000-12 (2000 = 100) YB15.png



File:Total environmental tax revenue by type of tax, EU-28, 2006-13 (€) (billion EUR) YB15.png



File:Total environmental protection expenditure by domain, EU-28, 2013 (€) (% of GDP) YB15 II.png





Group Exercise

- Small country (10,000 households, government, 3 companies)
 - Government:
 - Collects \$1,000K from households for sewage treatment
 - Collects \$20,000K from households for general taxes
 - Pays \$900K to ST Company for treating sewage
 - ST Company:
 - Purchases services from ECS company for redesign for \$40K
 - ECS company manufactures and sells \$100K in solar panels to households
 - Households:
 - Donate \$50K in used products to RG company
 - RG company:
 - Sells recycled products for \$50K
 - Manufactures hiking boots & sells to households to \$100K
- Calculate Gross EPE and EGSS

Sector	EPE	EGSS
Government		
Households		
ST company		
ECS Company		
RG Company		
Total		



Group Exercise (one answer)

- Government:
 - (a) Collects \$1m from households for sewage treatment
 - Collects \$20M from households for general taxes
 - (b) Pays \$900K to ST Company for treating sewage
- ST Company:
 - (c) Purchases services from ECS company for redesign for \$40K
- ECS company:
 - (d) manufactures and sells \$100K in solar panels to households
- Households:
 - (e) Donate \$50K in used products to RG company
- RG company:
 - (e) Sells recycled products for \$50K
 - Manufactures hiking boots & sells to households to \$100K
- Gross EPE and EGSS = \$2090

Sector	EPE	EGSS
Government	(b) 900	(a) 1000
Households	(a) 1000 (d) 100 (e) 50	
ST company	(c) 40	(b) 900
ECS Company		(c) 40 (d) 100
RG Company		(e) 50
Total (Gross)	\$2090	\$2090

Gross vs net?

Environmental Activities

- Discussion

- Does your NSO track Environmental Activities?
 - EPE, EGSS, taxes, subsidies?
- Which would be the most important?
- Who [are/could be] your data providers?

References

- Statistics Netherlands: <https://www.cbs.nl/en-gb/our-services/methods/surveys/korte-onderzoeksbeschrijvingen/environmental-protection-expenditure>
- Statistics Canada: <http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=1903>
- Eurostat: <http://ec.europa.eu/eurostat/web/environment/environmental-goods-and-services-sector>
- OECD: <http://www.oecd.org/tad/envtrade/environmentalgoodsandservices.htm>

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 - Sjoerd Schenau (Statistics Netherlands and Eurostat course on Environmental Taxes)

Group Exercise

- Small country (10,000 households, government, 3 companies)
 - Government:
 - Collects \$1m from households for sewage treatment
 - Collects \$20M from households for general taxes
 - Pays \$900K to ST Company for treating sewage
 - ST Company:
 - Operates sewage treatment plant for \$800K/year
 - Purchases services from ECS company for redesign for \$50K
 - ECS company sells \$100K in solar panels to households
 - Households:
 - Donate used products to RG company
 - RG company:
 - Sells recycled products for \$50K
 - Manufactures hiking boots & sells to households to \$100K
- Calculate EPE and EGSS (from/to)

