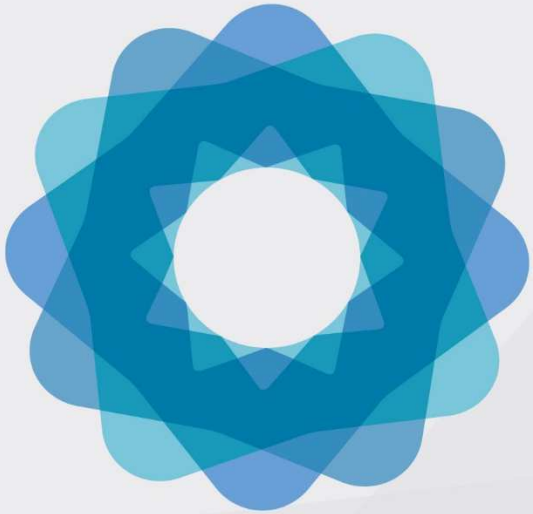

System of Environmental Economic Accounting

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Air emission accounts

Sjoerd Schenau

United Nations

Content

- Why compile air emission accounts ?
- What are the air emission accounts ?
- What is the scope of these accounts ?
- How to compile air emission accounts ?
- What can you do with these accounts ?

Air emission accounts

Emissions to air are gaseous and particulate substances released to the atmosphere by establishments and households as a result of production, consumption and accumulation processes.

The **SEEA air emissions account** records the generation of air emissions by resident economic units, by type of substance.

They are fully coherent with SNA:

- Residence principle
- Allocation to industries (ISIC) and households

→ *Data from the air emission accounts differ from the IPCC figures*

Economic boundary with respect to air emissions

Some air emissions will occur when economic units undertake activity in other countries.

Consistent with the general definition of the economic boundary using the concept of residence, air emissions accounts for a nation will **exclude** emissions released within a national territory by non-residents (such as tourists and foreign transportation operations), whereas the emissions abroad of resident economic units will be **included**.

Air emission accounts also do **not** record the extent of the capture or embodiment of gases by the environment, for example, carbon captured in forests and soil.

Other scope issues

Included within the scope of air emissions in the air emissions account is a range of other emissions that are the direct result of economic production processes, namely, the emissions from cultivated **livestock** due to digestion (primarily methane), and **emissions from soil** as a consequence of cultivation or of other soil disturbances

Emissions from natural processes such as unintended forest and grassland fires and human metabolic processes which are not the direct result of economic production are excluded.

Typical components for groups of residuals (Table 3.2.4 SEEA-CF)

Emissions to air

Carbon Dioxide, Methane, Di-Nitrogen oxide, Nitrous oxides, Hydro fluorocarbons, Per fluorocarbons, Sulphur Hexafluoride, Carbon monoxide, Non-methane volatile organic compounds, Sulphur dioxide, Ammonia, Heavy metals, Persistent organic pollutants, Particulates (e.g. PM10, dust)

Residuals from dissipative use of products

Unabsorbed nutrients from fertilisers, salt spread on roads

Dissipative losses

Abrasion (tyres/brakes), Erosion/corrosion of infrastructure (roads, etc.)

Classification for industries and households

Industry: **NACE Rev.2 nomenclature**

(statistical classification of economic activities in the European Community)

Households: **COICOP** (Classification of Individual Consumption by Purpose)

e.g. transport, heating, other

Other (accumulation): waste dumps

Emission types

1. **Emissions from combustion**

   Combustion of fossil fuels for final demand

   Combustion of fossil fuels for production of electricity or heat

   Combustion of biomass (short cyclic)

2. **Emissions from conversion processes**

   Conversion from fossil fuels

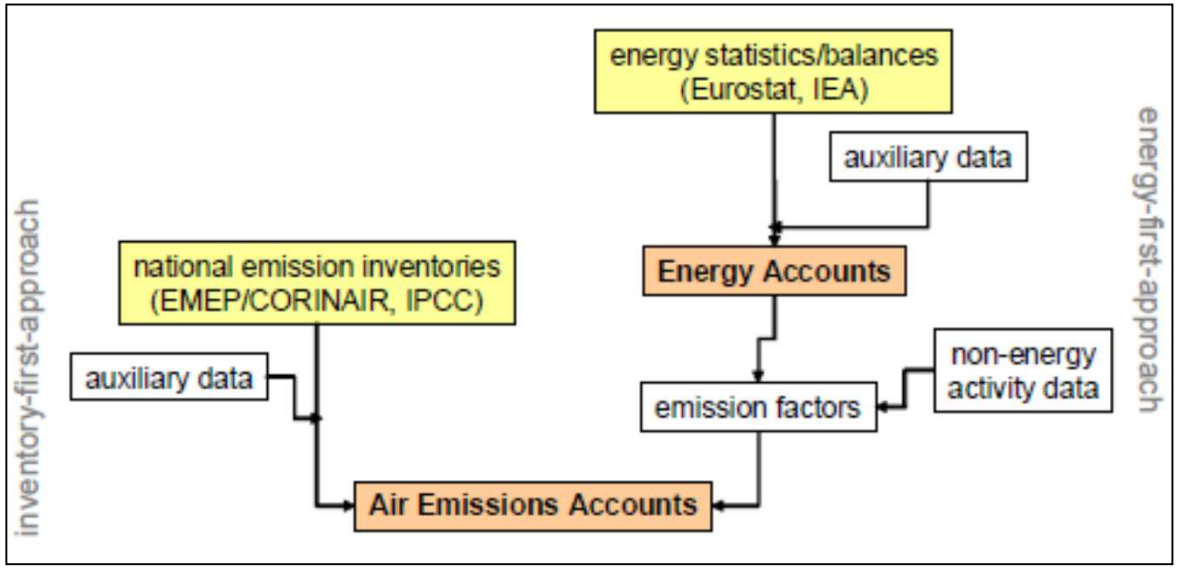
   Conversion from non-fossil fuels

The air emission account

Supply table for air emissions

	Generation of emissions								Accumulation	Total supply of emissions
	Industries					Households			Emissions from landfill	
	Agriculture	Mining	Manufacturing	Transport	Other	Transport	Heating	Other		
Type of substance										
Carbon dioxide	10 610.3	2 602.2	41 434.4	27 957.0	82 402.4	18 920.5	17 542.2	1 949.1	701.6	204 119.6
Methane	492.0	34.1	15.8	0.8	21.9	2.4	15.5	1.7	222.0	806.3
Dinitrogen oxide	23.7		3.5	0.8	2.6	1.0	0.2	0.1	0.1	32.0
Nitrous oxides	69.4	6.0	37.9	259.5	89.0	38.0	12.1	1.3	0.3	513.6
Hydroflourocarbons			0.3		0.4					0.7
Perflourocarbons										
Sulphur hexaflouride										
Carbon monoxide	41.0	2.5	123.8	46.2	66.2	329.1	51.2	5.7	1.1	666.9
Non-methane volatile organic compounds	5.2	6.5	40.0	16.4	27.2	34.5	29.4	3.2	0.9	163.3
Sulphur dioxide	2.7	0.4	28.0	62.4	8.1	0.4	0.4	0.1	0.0	102.5
Ammonia	107.9		1.7	0.2	0.9	2.3	11.4	1.2	0.2	125.9
Heavy metals										
Persistent organic pollutants										
Particulates (incl PM10, dust)	7.0	0.1	8.5	9.3	4.4	6.0	2.8	0.5	0.0	38.5

Compilation



Two approaches:

1. Energy-first-Approach:

   →Compile Energy Accounts using energy balance / energy statistics

   → Compile net energy accounts for air emissions

   →Calculate emissions via:

   Emission = Fuel use * EF (by fuel type)

2. Inventory first approach

Or Use and combine both and confront …

Two main compilation issues

1. **Correcting for residence principle**
   → Adjustments for transportation

2. **Assigning emissions to industry (NACE/ISIC)**
   → Assigning emissions to Industry and households

IPCC versus air emission accounts

The **IPCC** (Intergovernmental Panel on Climate Change) has drawn up specific guidelines to estimate and report on national inventories of anthropogenic greenhouse gas emissions and removals

Differences between AEA and IPCC totals

- Adjustment for the **residence principle**: AEA follow the residence principle whereas national emission inventories follow more or less a territory principle.
- National totals are defined differently in national emission inventories regarding **international transport**, e.g. emissions from international air transport are excluded in UNFCCC inventory totals whereas they are partly included in national inventory totals.
- **Short cyclic CO2** is excluded from the IPCC totals

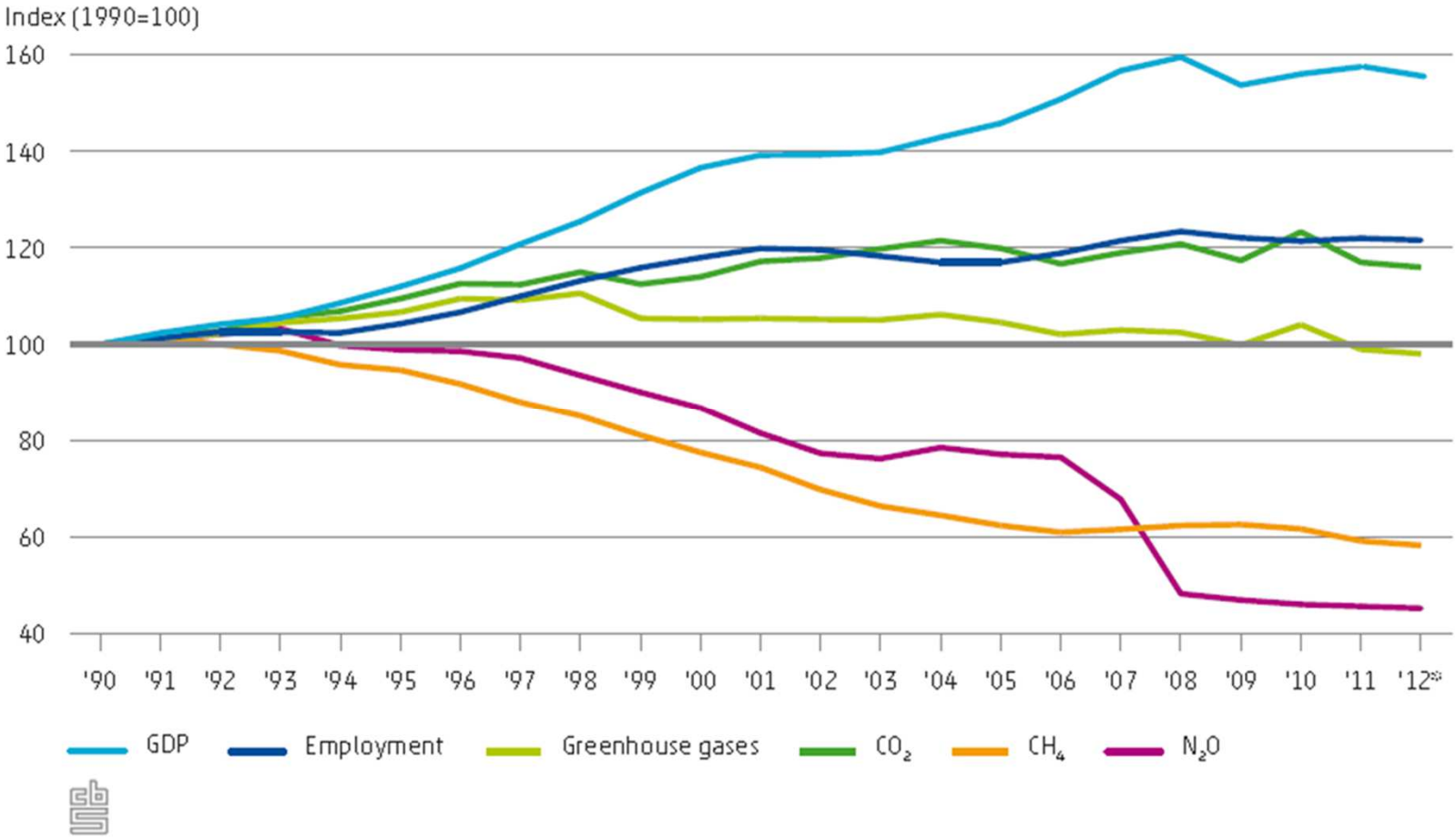
Bridge table

	2001	2005	2010	2011	2012	2013*
	Mton CO_2 equivalents					
1. Stationary sources[1]	184	180	183	169	168	168
2. Mobile sources on Dutch territory	40	41	41	42	41	41
3. Mobile sources according to IPCC	38	39	38	39	37	36
4. Short cyclic CO_2	8	11	14	14	14	13
5. Total, IPCC (excl. LULUCF)[2] = 1+3-4	213	208	208	194	191	192
6. Land Use, Land-Use Change and Forestry (LULUCF)	3	3	3	3	3	3
7. Total, IPCC (incl. LULUCF) = 5+6 (Kyoto-protocol)	215	211	211	197	195	195
8. Actual emissions in the Netherlands = 1+2	224	221	224	211	209	210
9. Residents abroad	26	26	25	25	26	26
10. Non-residents in the Netherlands	6	7	7	7	7	7
11. Total emissions by residents = 8+9-10	243	241	243	229	228	228

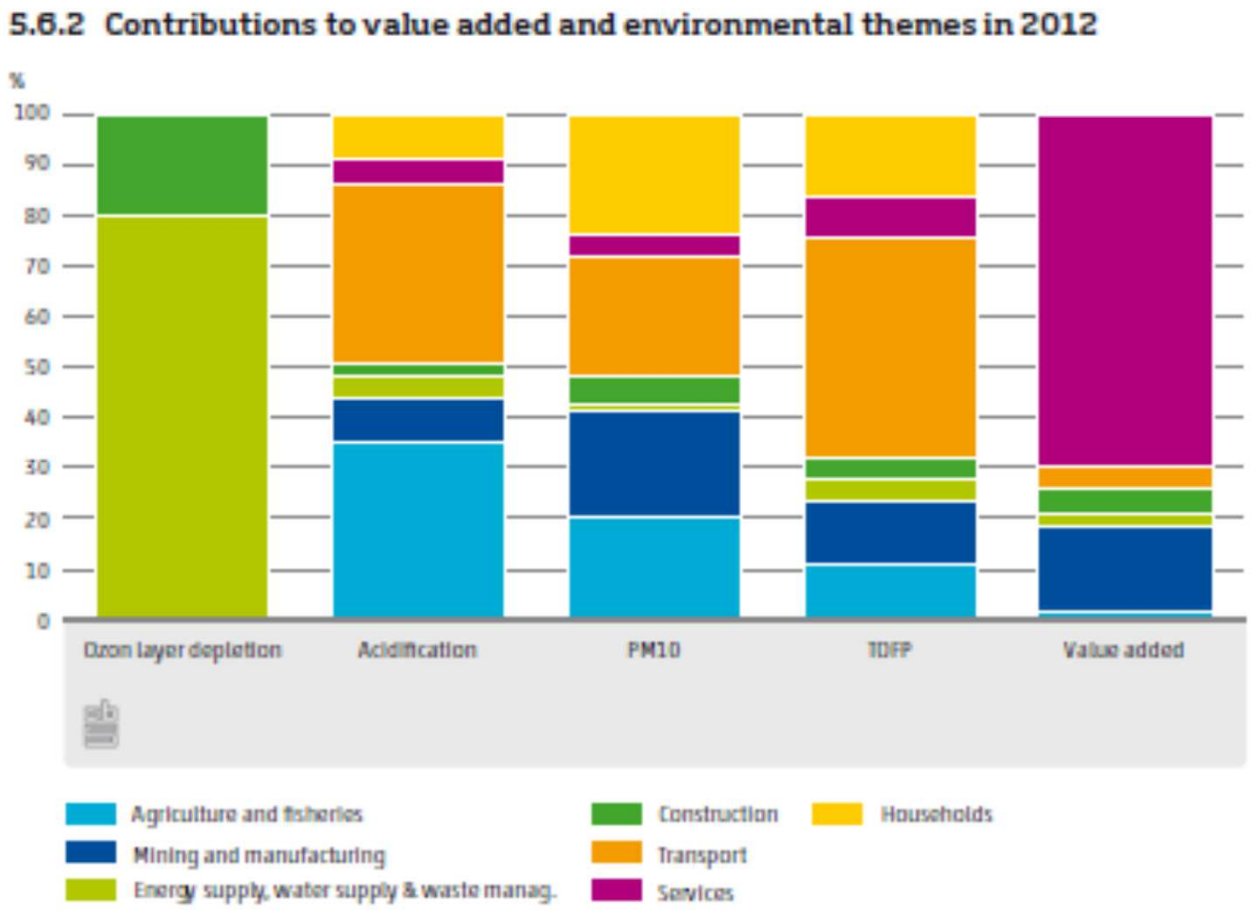
What can you do with air emission accounts ?

- **Key indicators**
  - →Totals for the economy
  - → Emission and energy intensities by industry
  - → Decoupling
- **2030 Sustainable Development Agenda**
  - → Goal 7 on Energy
- **Analysis**
  - →Decomposition analysis
  - →Input for footprint analysis
- **Modelling and scenario analysis**

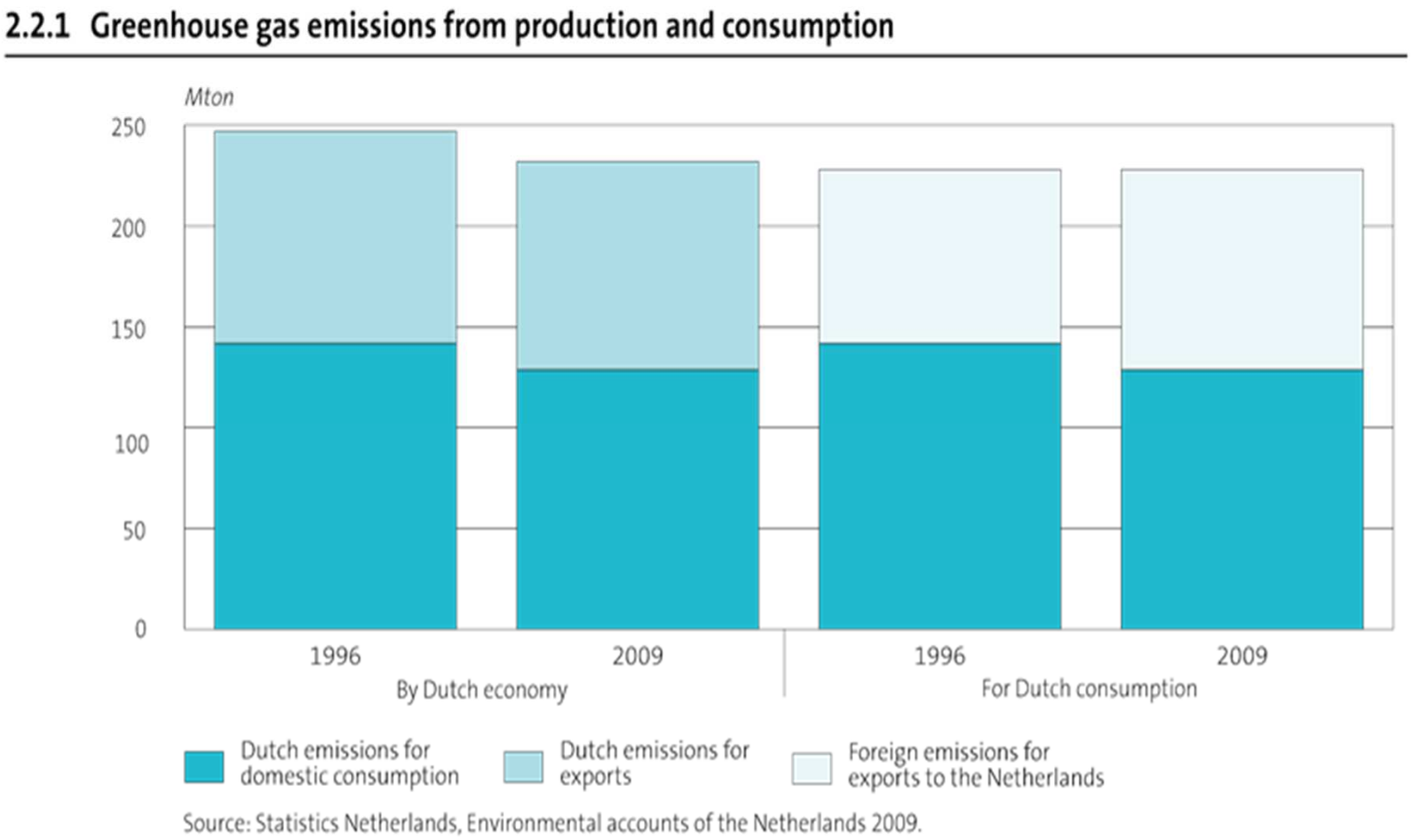
Decoupling air emissions and GDP



Contributions by sector



Greenhouse gas emissions



EXERCISE

Calculate the CO_2 emissions based on the energy PSUT you have and the following information.

Typical emission factors for combustion of fuels are:

	Emissions factor ton CO_2/TJ
Coal	96
Gasoline	70
Fuel wood	110

Assume in addition, that from your IPCC emission inventory you get the information that 139 kilotonnes of CO_2 is released due to production processes, which chemically transform raw materials from one form to another. These processes take place within *Other industries.*

SEEA