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FOR A STRONGER AND GREENER ECONOMY
UNECE

Water Accounts Overview

Physical Accounts

Michael Nagy
Environment and Multi-Domain Statistics Section
UNECE Statistical Division

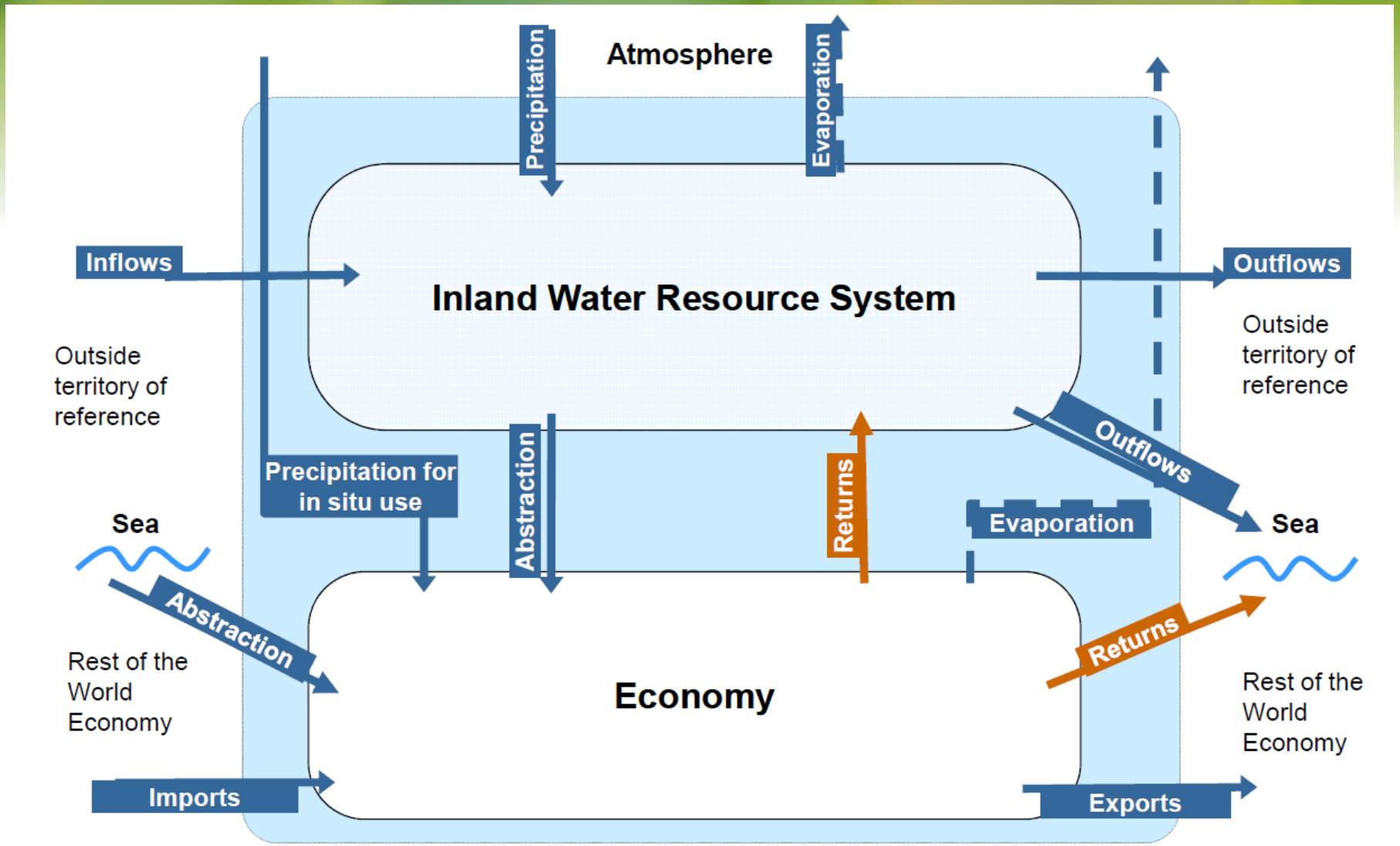
Why water accounts?

- Organizing economic and hydrological information in the same way
- Enabling a consistent analysis of the contribution of water to the economy and the impact of the economy on water resources
- Ideal for addressing cross-sectoral issues (e.g. IWRM, MDGs, SDGs, etc.)

What is important for producers of water accounts?

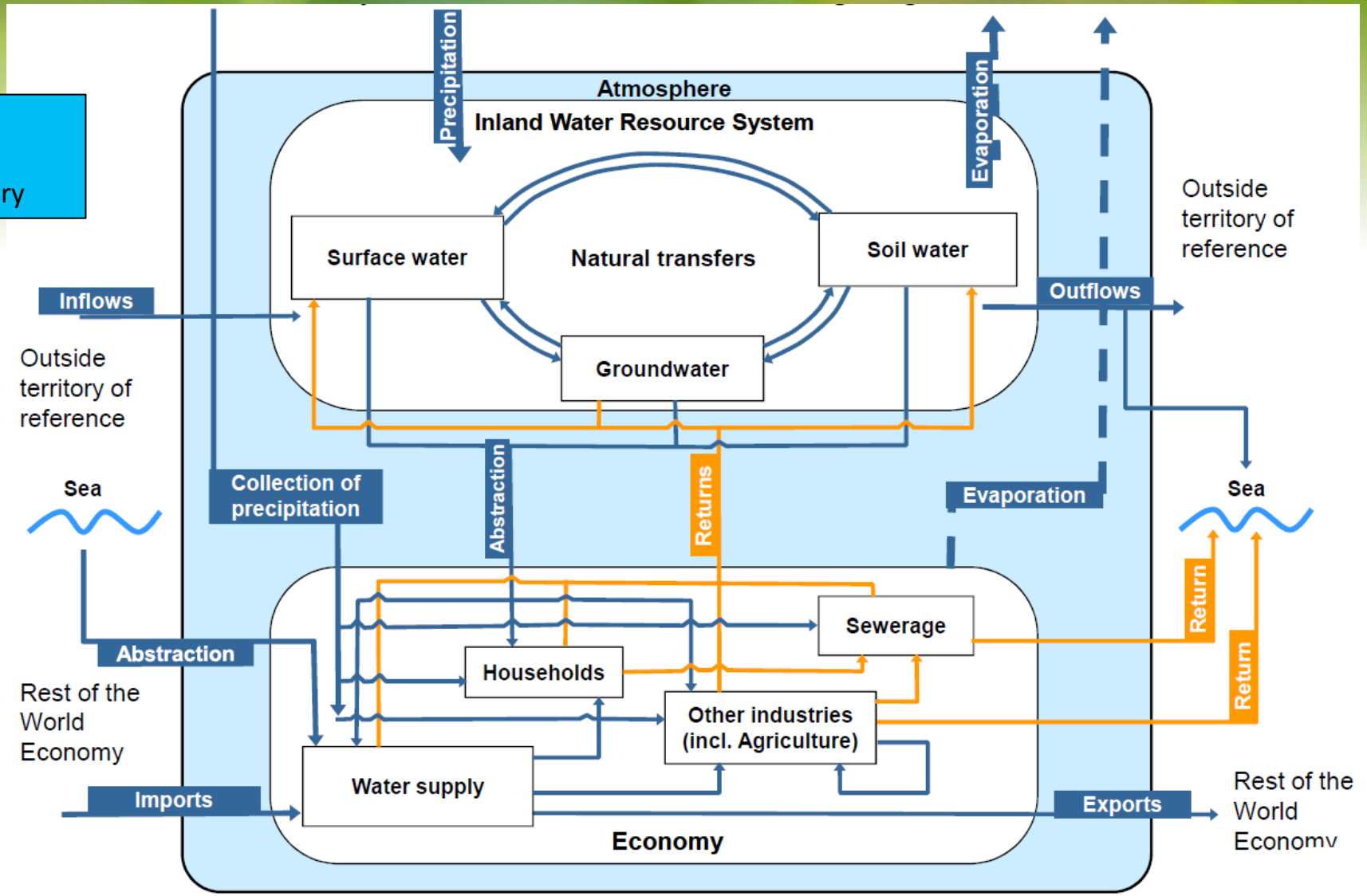
1. Knowing user needs
2. Conceptual understanding of water stocks and flows
3. Familiar with terms, definitions and classifications
4. Availability of basic water statistics and monetary data items
5. Understanding of main accounting principles
6. Understanding of structure of the water accounting tables.

Stock-Flow Model of SEEA Water



Stock-Flow Model of SEEA Water

Stocks – Flows
&
Physical - Monetary



Terms, Definitions, Classifications

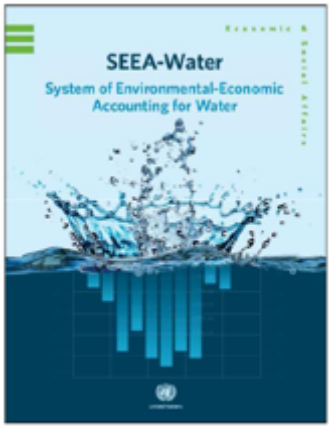
Classifications:

- Economic Activities: ISIC rev. 4.0
- Products: CPC ver. 2
- Environmental Assets

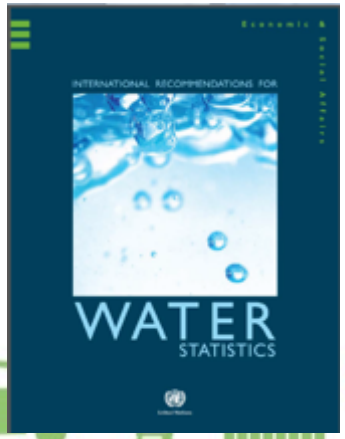
Terms, definitions, methodological guidance (see http://unstats.un.org/unsd/envaccounting/):

SEEA CF (2014)

SEEA-Water (2007)

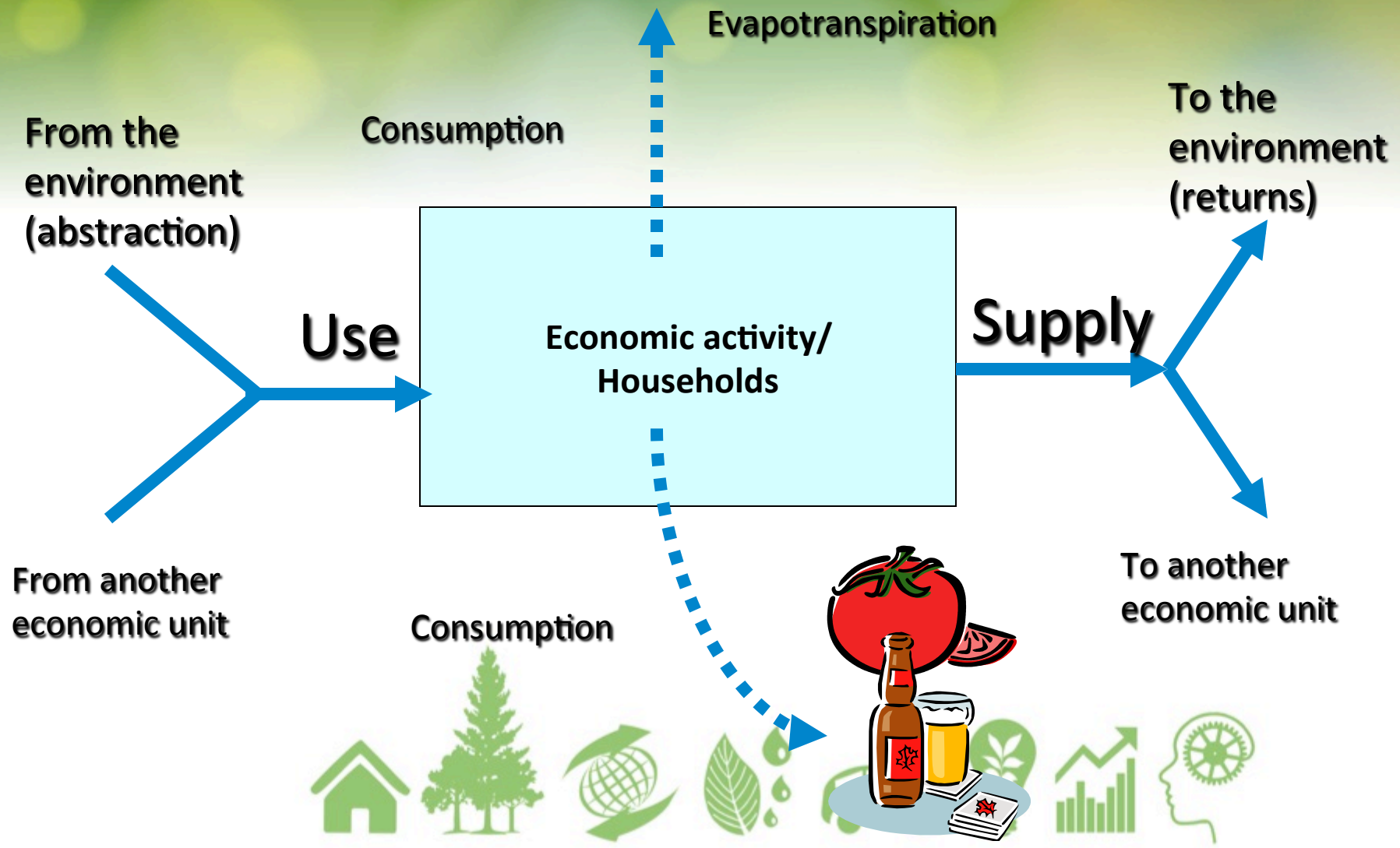


IRWS (2012)



Methodological Guidelines (2014)

Basic concepts and definitions



Water Assets: Classification of inland water bodies

1. Surface water
    - 1.1 Artificial reservoirs
    - 1.2 Lakes
    - 1.3 Rivers and streams
    - 1.4 Glaciers, snow and ice
2. Groundwater
3. Soilwater

Water-Tables in the SEEA-CF

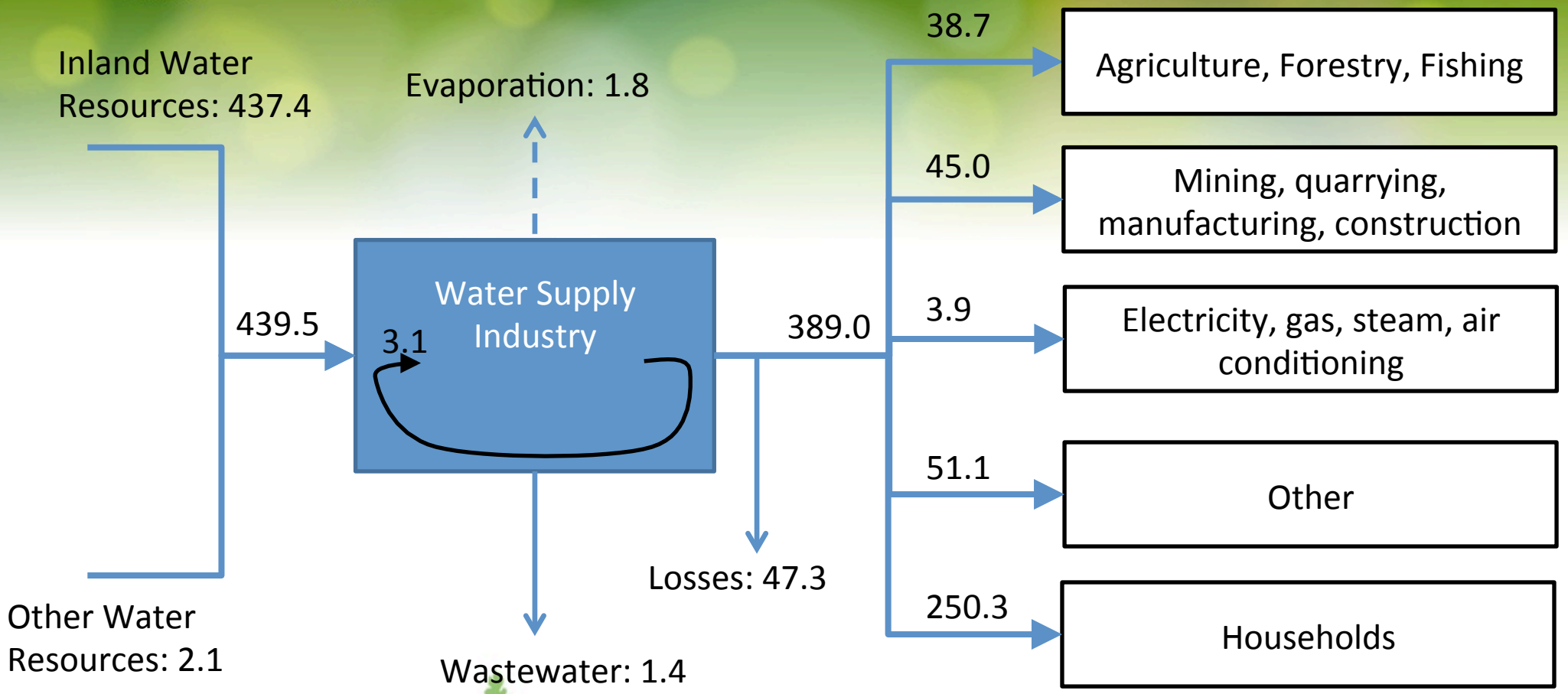
- Physical supply table
- Physical use table
- Physical asset accounts
- Water emission accounts
- Supply and use table in physical and monetary terms

+ some additional tables for more details in SEEA-Water

Physical Supply and Use Table

1. Flows from the environment to the economy
2. Flows from the economy to the environment
3. Flows within the economy

Water flow example



Physical Supply Table (simplified)

	Abstraction of water; production of water; generation of return flows							RoW		
	01-03	05-33, 41-43	35	36	37	38, 39, 45-99	Households	Imports	Environment	Total supply
(I) Sources of abstracted water										
Inland water resources									966.9	966.9
Other water resources									202.1	202.1
(II) Abstracted water										
For distribution				389.0						389.0
For own-use	108.4	114.6	404.2	3.1	100.1	2.3				732.7
(III) Wastewater and reused water										
Wastewater	17.9	117.6	5.6	1.4		49.1	235.5			427.1
Reused water produced		10			42.7					52.7
(IV) Return flows of water										
To inland water resources	65	23.5	300	47.3	227.5	0.7	4.6			668.6
To other sources		5.9	100		256.3		0.2			362.4
(V) Evaporation of abstracted water, transpiration and water incorporated into products	76.2	43.2	2.5	1.8	0.7	3.6	10			138.0
Total supply	267.5	314.8	812.3	442.6	627.3	55.7	250.3		1169.0	3939.5

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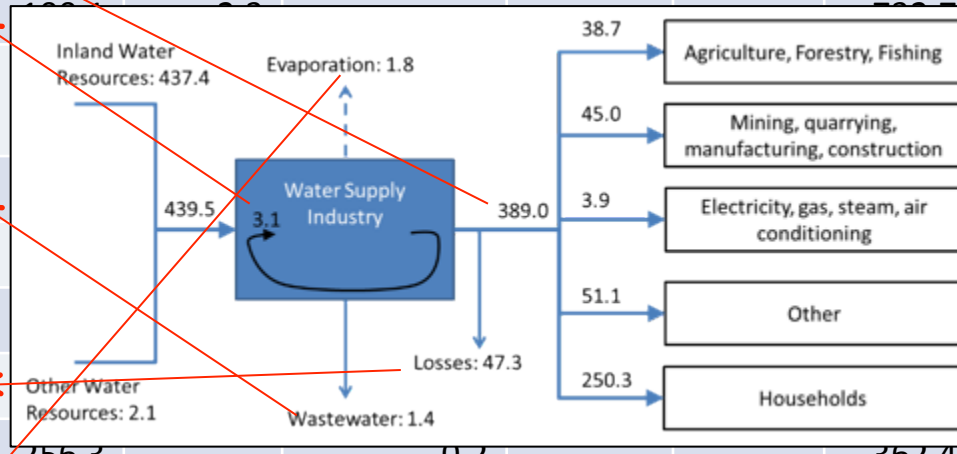

Physical Use Table (simplified)

	Abstraction; intermediate consumption; return flows						F. cons.		RoW		
	01-03	05-33, 41-43	35	36	37	38, 39, 45-99	House holds	Accu m.	Expo rts	Enviro nment	Total use
(I) Sources of abstracted water											
Inland water resources	108.4	114.5	304.2	437.4	0.1	2.3					966.9
Other water resources			100.0	2.1	100.0						202.1
(II) Abstracted water											
Distributed water	38.7	45.0	3.9			51.1	250.3				389.0
Own-use	108.4	114.6	404.2	3.1	100.1	2.3					732.7
(III) Wastewater and reused water											
Wastewater received from other units					427.1						427.1
Reused water	12.0	40.7									52.7
(IV) Return flows of water											
To inland water resources										668.6	668.6
To other sources										362.4	362.4
(V) Evaporation of abstracted water, transpiration and water incorporated into products								10.2		127.8	138.0

Physical Use Table (simplified)

	Abstraction; intermediate consumption; return flows						F. cons.		RoW		
	01-03	05-33, 41-43	35	36	37	38, 39, 45-99	House holds	Accu m.	Expo rts	Enviro nment	Total use
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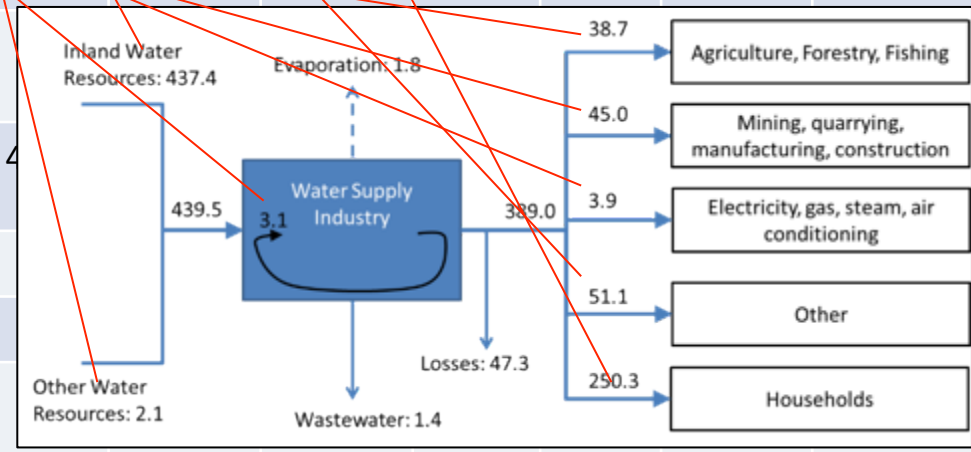
Own-use	108.4	114.6	404.2	3.1	100.1	2.3					732.7
(III) Wastewater and reused water											
Wastewater received from other units											
Reused water	12.0	40.7									
(IV) Return flows of water											
To inland water resources											
To other sources										362.4	362.4
(V) Evaporation of abstracted water, transpiration and water incorporated into products								10.2		127.8	138.0



Full Physical Supply Table (SEEA-CF)

	Abstraction of water; Production of water; Generation of return flows							Flows from the rest of the world	Flows from the environment	Total supply
	Agriculture, forestry and fishing	Mining & quarrying, Manufacturing and Construction	Electricity, gas, steam and air conditioning supply	Water collection, treatment and supply	Sewerage	Other industries	Households	Imports		
(I) Sources of abstracted water										
Inland water resources										
Surface water										
Groundwater										
Soil water										
Total										
Other water sources										
Precipitation										
Sea water										
Total										
Total supply abstracted water										
(II) Abstracted water										
For distribution										
For own-use										
(III) Wastewater and reused water										
Wastewater										
Wastewater to treatment										
Own treatment										
Reused water produced										
For distribution										
For own use										
(IV) Return flows of water										
To inland water resources										
Surface water										
Ground water										
Soil water										
Total										
To other sources										
Total Return flows										
of which: Losses in distribution										
(V) Evaporation of abstracted water, transpiration and water incorporated into products										
Evaporation of abstracted water										
Transpiration										
Water incorporated into products										
Total supply										

Full Physical Use Table (SEEA-CF)

	Abstraction of water; Intermediate consumption; Return flows						Final consumption	Accumulation	Flows to the rest of the world	Flows to the environment	Total use
	Agriculture, forestry and fishing	Mining & quarrying, Manufacturing and Construction	Electricity, gas, steam and air conditioning supply	Water collection, treatment and supply	Sewerage	Other industries	Households		Exports		
(I) Sources of abstracted water											
Inland water resources											
Surface water											
Groundwater											
Soil water											
Total											
Other water sources											
Precipitation											
Sea water											
Total											
Total use abstracted water											
(II) Abstracted water											
Distributed water											
Own use											
(III) Wastewater and reused water											
Wastewater											
Wastewater received from other units											
Own treatment											
Reused water											
Distributed reuse											
Own use											
Total											
(IV) Return flows of water											
Returns of water to the environment											
To inland water resources											
To other sources											
Total return flows											
(V) Evaporation of abstracted water, transpiration and water incorporated into products											
Evaporation of abstracted water											
Transpiration											
Water incorporated into products											
Total use											

Physical Supply and Use Table: all rows in detail

(I) Sources of abstracted water
Inland water resources
Surface water
Groundwater
Soil water
Total
Other water sources
Precipitation
Sea water
Total

(II) Abstracted water
For distribution
For own-use

(III) Wastewater and reused water
Wastewater
Wastewater to treatment
Own treatment
Reused water produced
For distribution
For own use
Total

(IV) Return flows of water
To inland water resources
Surface water
Groundwater
Soil water
Total
To other sources
Total return flows
of which: Losses in distribution

(V) Evaporation of abstracted water, transpiration and water incorporated into products
Evaporation of abstracted water
Transpiration
Water incorporated into products

Physical Asset Account

- Stock of water at the beginning and end of an accounting period
- Flows of water:
  - Abstracted by the economy
  - Returned by the economy
  - Added through precipitation
  - Evaporated and evapotranspirated
  - Changes through flows between different water resources

Physical Asset Account

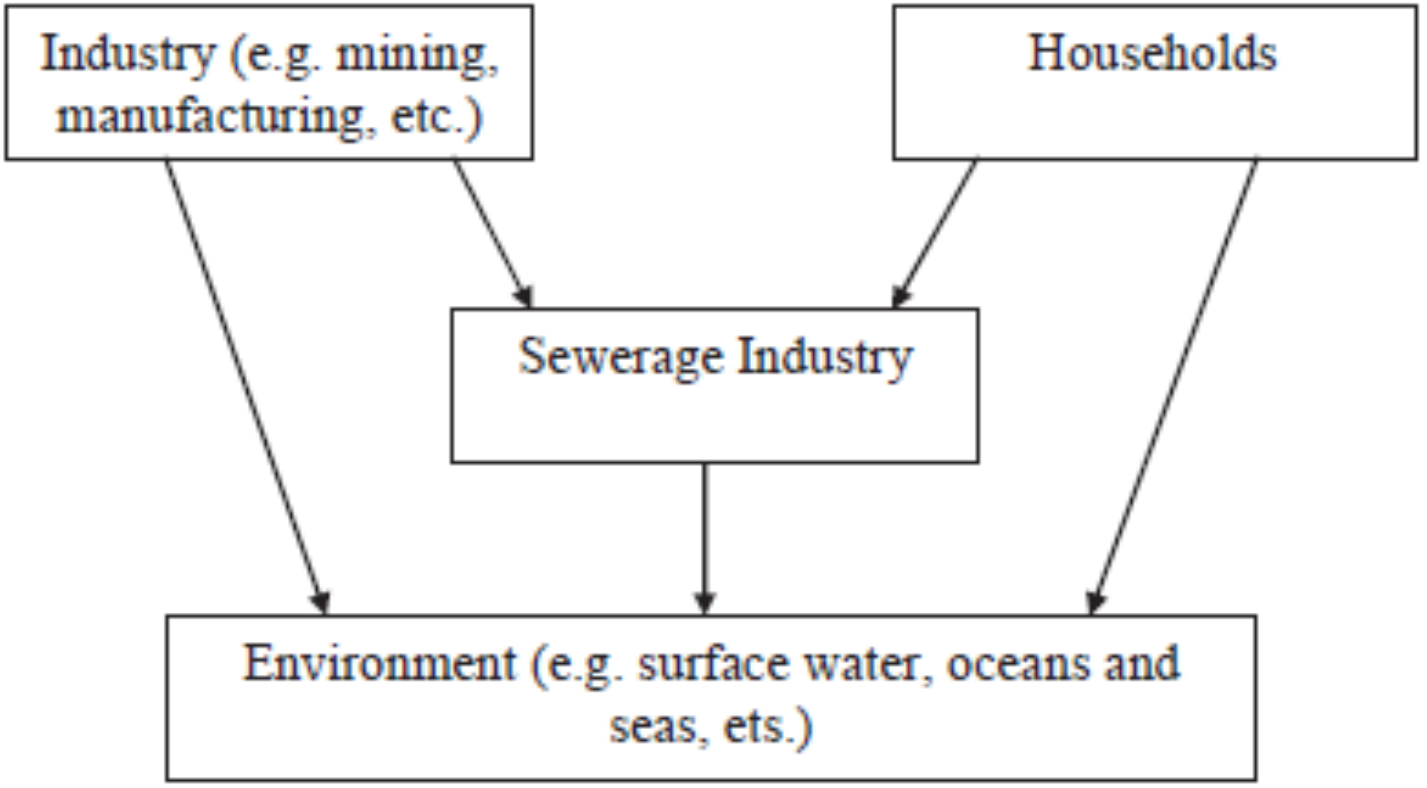
	Type of water resource						
	Surface water				Groundwater	Soil water	
	Artificial reservoirs	Lakes	Rivers and streams	Glaciers, snow and ice			Total
Opening stock of water resources	1 500	2 700	5 000		100 000	500	109 700
Additions to stock							
Returns	300		53		315		669
Precipitation	124	246	50			23 015	23 435
Inflows from other territories			17 650				17 650
Inflows from other inland water resources	1 054	339	2 487		437	0	4 317
Discoveries of water in aquifers							
Total additions to stock	1 478	585	20 240		752	23 015	46 071
Reductions in stock							
Abstraction	280	20	141		476	50	967
for hydropower generation							
for cooling water							
Evaporation and actual evapotranspiration	80	215	54			21 125	21 474
Outflows to other territores			9 430				9 430
Outflows to the sea			10 000				10 000
Outflows to other inland water resources	1 000	100	1 343		87	1 787	4 317
Total reductions in stock	1 360	335	20 968		563	22 962	46 188
Closing stock of water resources	1 618	2 950	4 272		100 189	553	109 583

Linked with PSUT

Linked with PSUT

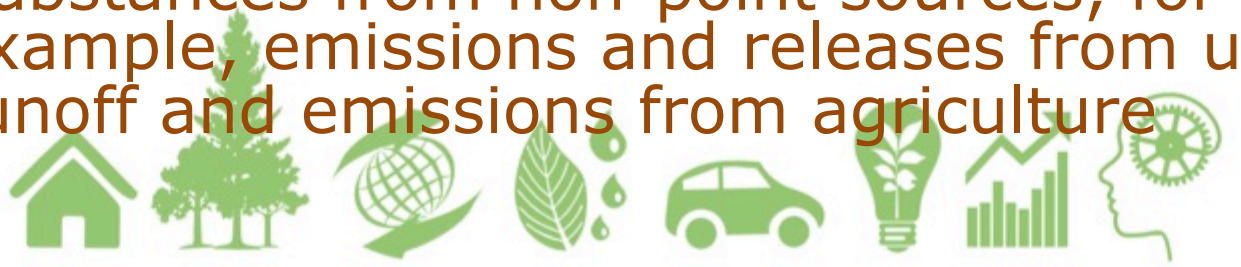
Water Emissions Account

Emissions to water are substances released to water resources by establishments and households as a result of production, consumption and accumulation processes.

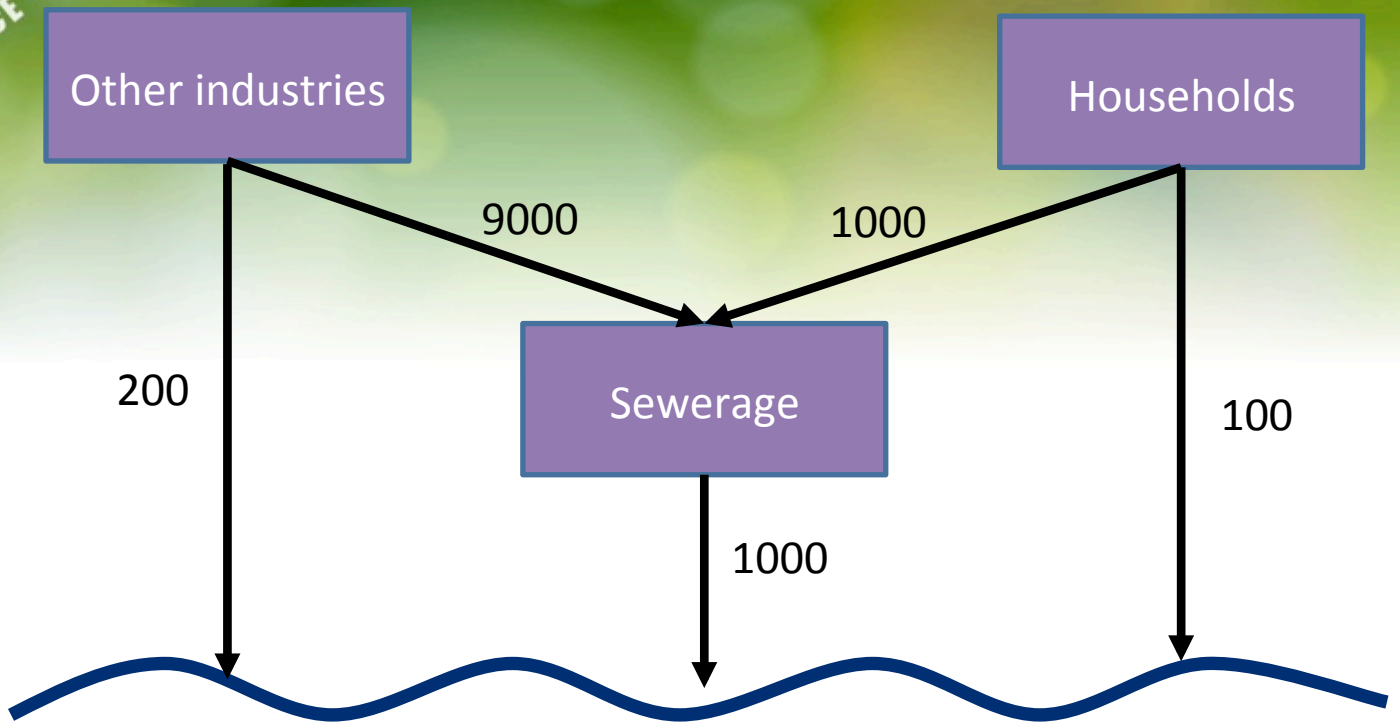


What do water emission accounts measure?

- Quantity of substances added to water by establishments and households during an accounting period.
- Quantities expressed in terms of mass (kilograms or tonnes)
- Water emission accounts cover:
  a) Substances added to wastewater and collected in the sewerage system
  b) Substances added to wastewater discharged directly to water bodies
  c) Substances from non-point sources, for example, emissions and releases from urban runoff and emissions from agriculture



Emission Accounts: simplified example (e.g. Nitrogen)



Indicator examples:

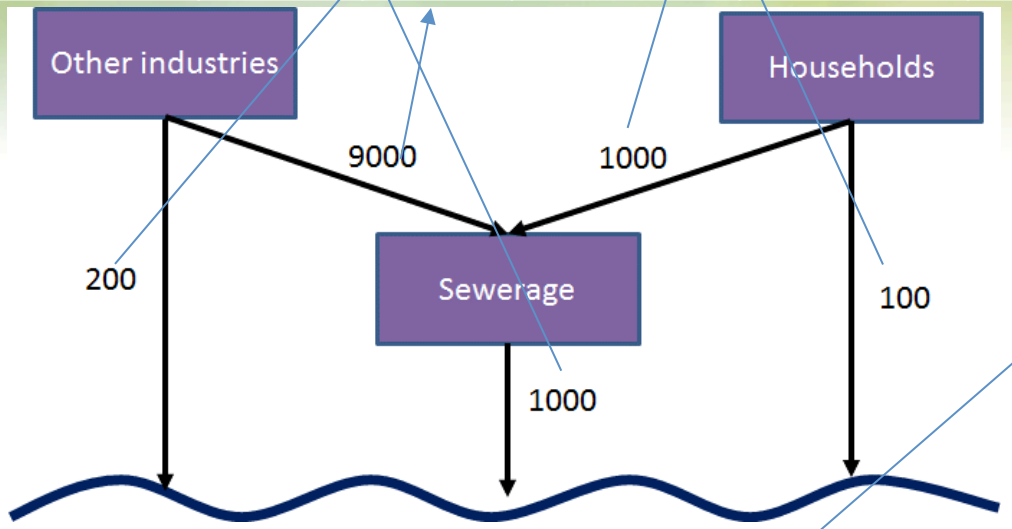
Treatment efficiency of sewerage industry: 90%

Net emissions households: 100 + 1000 x (1 – treatment efficiency) = 200

Net emissions other industries: 200 + 9000 x (1 – treatment efficiency) = 1100

Total emissions: 100 + 1000 + 200 = 1300

Supply Table	Generation of gross releases to water			Accumulation	Flows with the rest of the world	Flows from the environment	Total supply
	Sewerage industry	Other industries	Households	Emissions from fixed assets			
Emissions by type of substance							
Nitrogen	1000	200	100				1300
Releases to other economic units							
Nitrogen		9000	1000				10000



Use Table	Collection of gross releases to water				Flows with the rest of the world	Flows to the environment	Total use
	Sewerage industry	Other industries	Households				
Emissions received by the environment							
Nitrogen						1300	1300
Collection by other economic units							
Nitrogen	10000						10000

Water Emissions: Supply Table

Physical supply table for gross releases of substances to water

	Generation of gross releases to water			Accumulation	Flows with the rest of the world	Flows from the environment	Total supply
	Sewerage industry	Other industries	Households	Emissions from fixed assets			
Emissions by type of substance							
BOD/COD[a]	5 594	11 998	2 712				20 304
Suspended solids							
Heavy metals							
Phosphorus	836	1 587	533				2 956
Nitrogen	10 033	47 258	1 908				59 199
Releases to other economic units							
BOD/COD[a]		7 927	8 950				16 877
Suspended solids							
Heavy metals							
Phosphorus		814	6 786				7 600
Nitrogen		15 139	30 463				45 602

Water Emissions: Use Table

Physical use table for gross releases of substances to water

	Generation of gross releases to water			Flows with the rest of the world	Flows to the environment	Total Use
	Sewerage industry	Other industries	Households			
Emissions received by the environment						
BOD/COD[a]					20 304	20 304
Suspended solids						
Heavy metals						
Phosphorus					2 956	2 956
Nitrogen					59 199	59 199
Collection by other economic units						
BOD/COD[a]	16 877					16 877
Suspended solids						
Heavy metals						
Phosphorus	7 600					7 600
Nitrogen	45 602					45 602

Take home messages

- Physical supply table, use table and asset account are linked with each other
- Recording of water flows according to accounting principles
- Most parts can be compiled from water statistics
- Benefits:
  - Integration with other accounts
  - Many important indicators can be derived
  - Useful for analysis of impact of economic changes on the environment
  - Useful for analysis of impact of changes of water availability on the economy

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Thank you for your attention!

michael.nagy@unece.org