



## Water Accounting Overview

Core tables, hybrid tables and monetary accounts

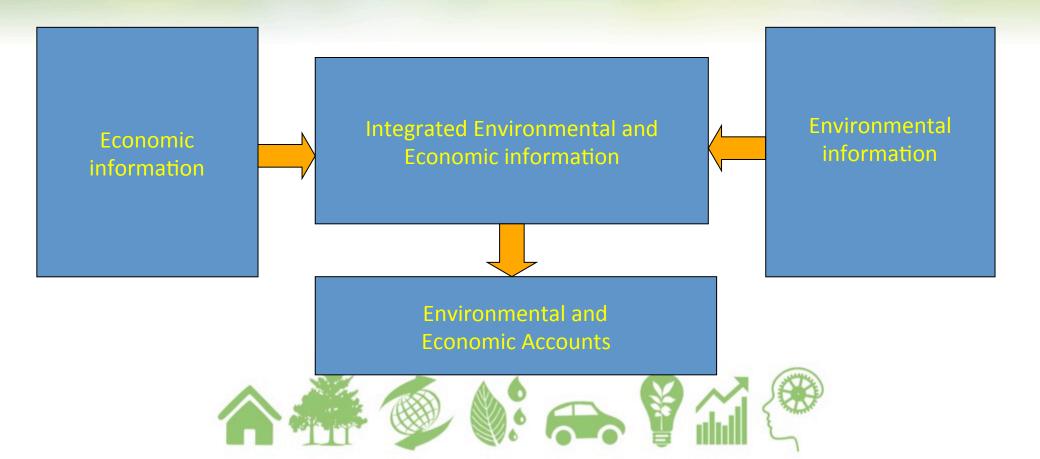
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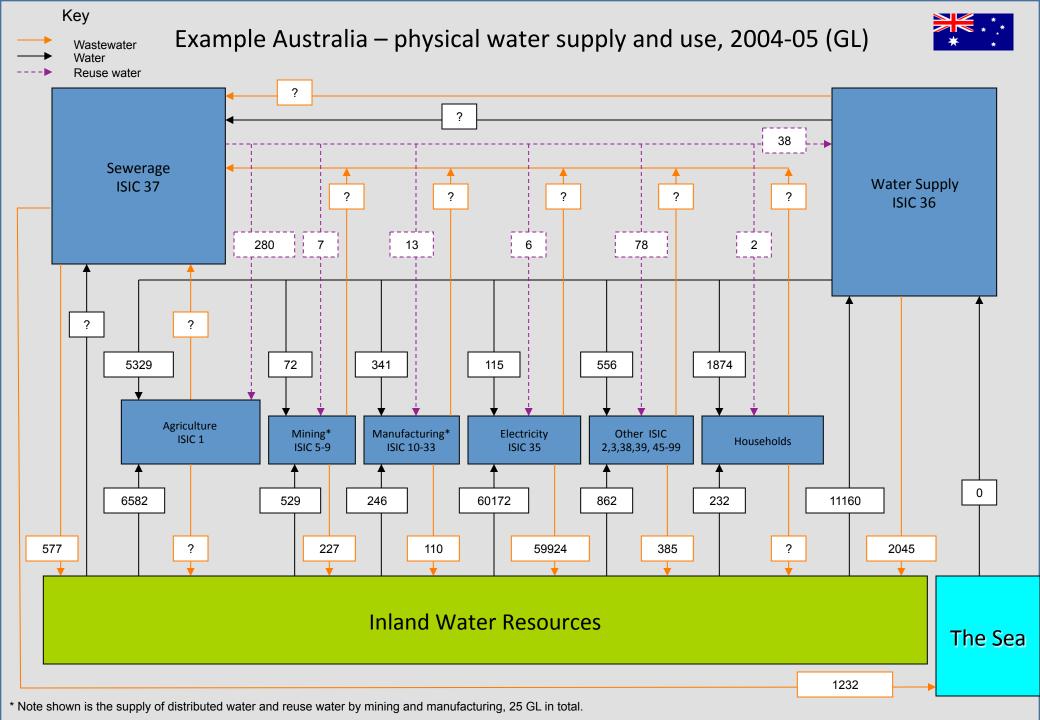


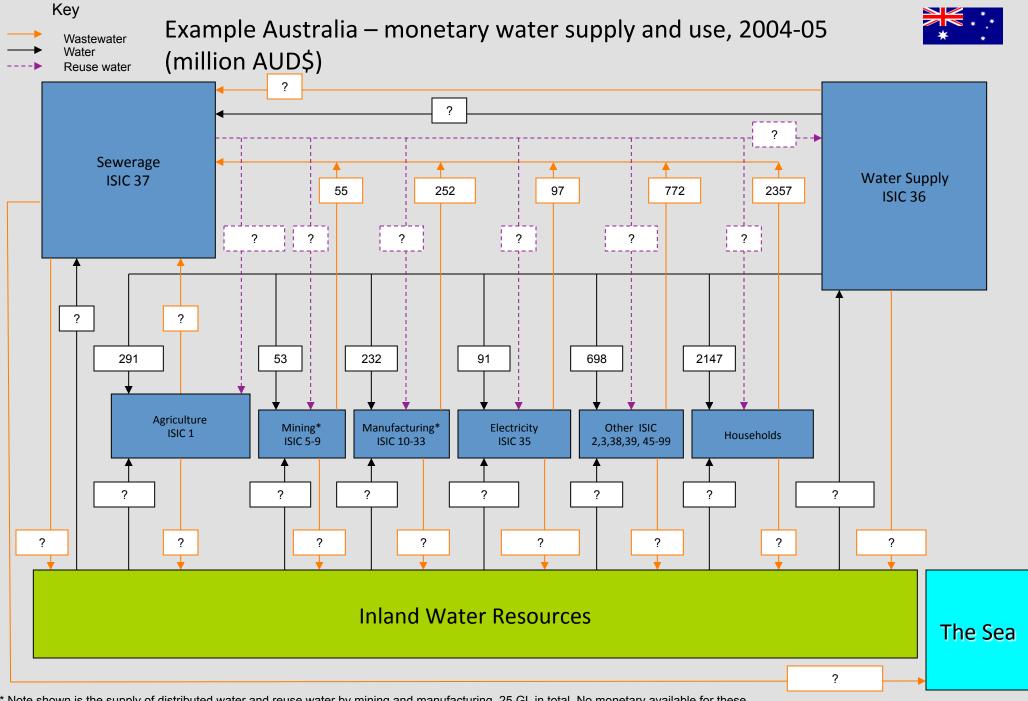


### **Environmental-economic accounting**

Brings together economic and environmental information





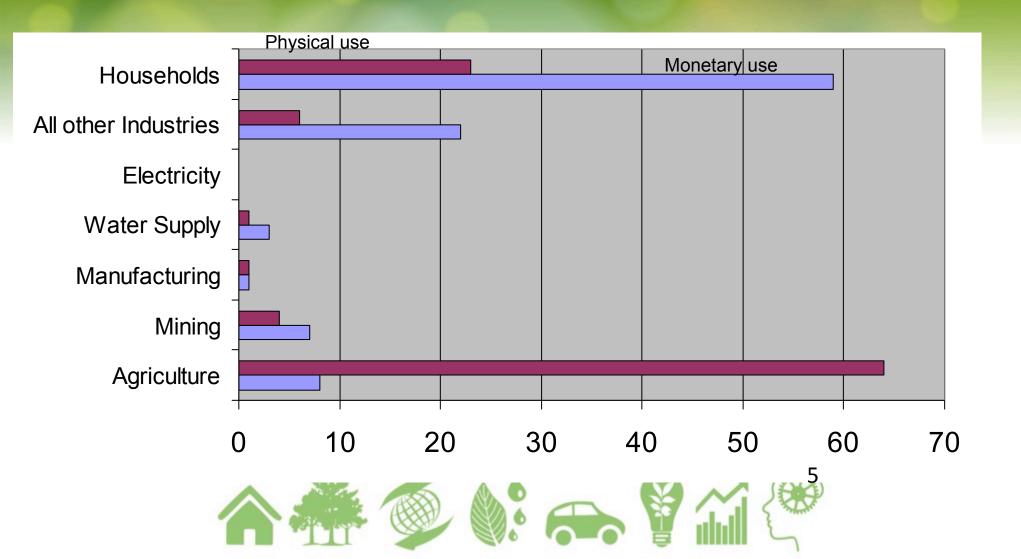


<sup>\*</sup> Note shown is the supply of distributed water and reuse water by mining and manufacturing, 25 GL in total. No monetary available for these.





## Example Australia: Monetary versus physical use of distributed water (% of total use)





## Hybrid water tables

Hybrid water tables bring physical and monetary information together in order to identify:

- The costs associated with production of waterrelated products and income generated by the production
- The investment in water-related infrastructure
- Costs of maintaining the infrastructure
- Fees paid by users for water-related services and subsidies received
- Help to design policies of cost-recovery and efficient water allocation

















## 7 Hybrid Tables of SEEA-Water

- 1. Hybrid supply table
- 2. Hybrid use table
- 3. Hybrid account for supply and use of water
- Hybrid account for water supply and sewerage for own use
- 5. Government accounts for water-related collective consumption services
- 6. National expenditure accounts for wastewater management
- Financing accounts for wastewater management

















## Water products (CPC Version 2)

### Natural water (CPC 1800)

 Excludes bottled water (CPC <u>2441</u> -Waters (including mineral waters and aerated waters), not sweetened nor flavoured

## Sewerage services (CPC 941)

- 9411 Sewerage and sewage treatment services
- 9412 Septic tank emptying and cleaning services

















## **Hybrid Supply Table**

- Hybrid Supply table (Table 5.1 of SEEAW) consist of 3 parts:
- 1)Monetary supply (in monetary units) (Output + imports);
- 2)Physical supply: water supplied to other units and discharged to the environment (in physical units);
- 3) Emission of pollutants (gross): pollutants added to water as a result of production and consumption.



















## **Hybrid Supply Table**

For water the greatest value should be here

							/						
		Output of industries (by ISIC cat//s)											
				35			abla					and	
								Total		Taxes	Subsidi	transpo	Total
				of			8,39	output, at		on	es on	rt	supply at
		2-33,		which:			, 45-	basic	Impor	produ	produc	margin	purchase
	1	41-43	Total	Hydro	36	/ <u>/</u> 37	99	prices	ts	cts	ts	S	r's price
1. Total output and supply (monetary units)													
of which:													
1.a Natural water (CPC 1800)													
1.b Sewerage services (CPC 941)													
2. Total supply of water (physical units)													
2.a - Supply of water to other economic													
2.b - Total returns													
3. Total (gross) emissions (physical units)													
Pollutants													
Note: Grey cells indicate zero entries by definition.													

Note: use of basic price and purchase's price in table











For water the greatest value should be here





## SNA Term: Basic price

The basic price is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any tax payable, and plus any subsidy receivable, on that unit as a consequence of its production or sale; it excludes any transport charges invoiced separately by the producer.

Relevant SNA Paragraphs 6.205. 15.28. [3.82.]

From UNSD – Glossary of SNA ( http://unstats.un.org/unsd/nationalaccount/ glossresults.asp?gID=25)





## SNA Term: Purchaser's price

Purchaser's price is the amount paid by the purchaser, excluding any deductible VAT or similar deductible tax, in order to take delivery of a unit of a good or service at the time and place required by the purchaser; the purchaser's price of a good includes any transport charges paid separately by the purchaser to take delivery at the required time and place.

Relevant SNA Paragraphs 6.215. 15.28. [2.73.] [3.83.]

From UNSD – Glossary of SNA (<a href="http://unstats.un.org/unsd/nationalaccount/glossresults.asp?gID=461">http://unstats.un.org/unsd/nationalaccount/glossresults.asp?gID=461</a>)















### Hybrid Use Table

- Monetary and physical flows of water within the economy
  - e.g. supply of water by the water supply industry (ISIC 36) to other industries
  - Equivalent to output in the SNA
- Monetery and physical flows of water from the environment to the economy
  - e.g. abstraction of water for own use by agriculture ISIC 01
  - This goes beyond the SNA, these flows are recorded in separate tables (tables V.3 and V.4 of SEEA-Water)



## Hybrid Use Table

Monetary use table shows the destination in terms of:

- Intermediate consumption
- Actual final consumption of households and government
- Gross capital formation
- Exports



















## Hybrid Use Table

Physical and monetary units  Intermediate consumption of industries (by ISIC Actual final consumption															
	_ In	iterme	diate c	onsumpt	ion of	indust	tries (t	y ISIC	Act	ual final	consum	ption		·	√ /
	,	$\overline{\Box}$		35	$\Box$		$\overline{}$	ĺ '		Iousehol			1	1 '	1 <b>"</b>
4	, J	1 7			1 1	, ,	1 1	1		Social		1 '	1	'	ا بو ا
1	, J	1 1	1 '	1 1	1 1	, ,	1 1	1	1	transf	, ,	1 '	1	'	l ji
1	, J	1 1	1 '	1 1	1 1	, ,	1 1	1	1		, ,	1 '	1	'	s p
1	, ,	1 1	1 1		1 1	, ,	1 1	1		ers in	, ,	1 '	1	'	ser
1	, ,	1 1	1 1		1 1	, ,	1 1	1	Final		, ,	1 '	1 _ '	'	ha
1	,	1 1	1 '	1 1	1 1	, ,	1 1	1	consu			1 '	ior	'	1 m
	, ,	1 1	1 1		1 1	, ,	1 1	1	mptio	Gover	, ,	1 😜 '	_ nat	'	t b
	, <i>!</i>	1 /	1 1		, 1	, ,	1 1	1	n	nment	, ,	l nen	l Gir	'	es a
	, <i>!</i>	1 /	1 1	of	, 1	, ,	38,39	1	expen	and	, ,		al f	rts	)Sn
	, ,	2-33,	1 1	which:	1 1	, ,	, 45-	Total	diture	NPISH	, ,	Government	Capital formation	Exports	Total uses at purchaser's price
	1	41-43	Total	Hydro	36	37		industry			Total	යි '	Ca	Ex	To
1. Total intermediate consumption and use (mo	onetar	y unit	s)												
of which: Natural water (CPC 1800)														7	
Sewerage services (CPC 941)														7	
2. Total value added (monetary units)															
3. Total use of water (physical units)															
3.a Total Abstraction	1														
of which: 3. a.1- Abstraction for own															
use		<u> </u>										<u>                                     </u>		<u> </u> '	
3.b Use of water received from other															
economic units		/												<u>                                     </u>	
Note: Grey cells indicate zero entries by definition.															

Note: purchaser's price is recorded in this table





## Final consumption by households

In SEEA-Water final consumption for household is the actual final consumption of households not the final consumption expenditure by households

This is a departure from SNA (which records the final consumption expenditure)

It is done because in many countries household do not directly purchase water rather it is provide free or almost free by government



















# Final consumption expenditure and actual final consumption

Total final consumption may be calculated as:

#### Final consumption expenditure

= Total value of expenditures on individual and collective goods and services of households, not for profit Institutions supporting households (NPISH) and government

#### Actual final consumption

= Value of individual goods and services acquired by households plus the value of collective services provided by the government







# Final consumption expenditure and actual final consumption

	Final consumption expenditure												
		Negra	Gover										
	Households (a)  43	NPSHIs individual (b)	Collective (c)	Individual (d)	Total (a)+(b)+ (c)+(d)								
Total use of products	<b>43</b>		2	50	100								

	Actual Consumption											
House	eholds											
Final consumption expenditures (a)	Social transfers in kind from Government and NPISHs (b)+(d)	Government (c)	Total (a)+(b)+ (c)+(d)									
43	5+50 = 55	2	100									



## Individual and collective goods and services

- Individual goods and services of government and NPISHs are those incurred for the benefit of individual households (e.g. supply of water to households by government, etc.)
- Collective goods and services of government are those incurred for the benefit of the community (e.g. water management, legislation and regulation)







## Hybrid accounts for water-related activities for own use

#### Hybrid accounts for own use are carried out for:

- Water supply
- Sewerage services

#### For each the following is needed

- Total intermediate consumption (rents, electricity)
- Total gross value added
  - Wages
  - Taxes less subsidies
  - Consumption of fixed capital
- Fixed capital formation
- Stocks of fixed assets

















## Hybrid accounts for water-related activities for own use

- This is one of the most data intensive tables to produce
- Comprehensive data can probably only be collected from specially designed surveys
- Alternatively a variety of other information sources may be used to estimated data



















# Hybrid accounts for water supply and sewerage for own use

FO	R EUROPE UNIT OF STATE OF STAT	erape for own ase									
		Physical and monetary units									
		Industries (by ISIC categories)									
		Industries (by ISIC categories)									
	<b>1. Costs of production</b> (=1.a+1.b) (Monetary units)										
4.	1. a. Total intermediate consumption										
Water supply for own use	1.b. Total value added (gross)										
uwc	1.b.1 Compensation of employees										
for	1.b.2 Other taxes less subsidies on production										
ply	1.b.3 Consumption of fixed capital	Largest numbers for water supply are typically for									
dns	2. Gross fixed capital formation (Monetary units)	agriculture and hydro-electricity.									
ıter	3. Stocks of fixed assets (Monetary units)										
Wa	4. Abstraction for own use (Physical units)										
	1. Costs of production (=1.a+1.b) (Monetary units)										
	units)										
	1.b. Total value added (gross)										
nse	1.b.1 Compensation of employees										
) wn	1.b.2 Other taxes less subsidies on production										
forc	1.b.3 Consumption of fixed capital	Largest numbers for sowerage may be synasted for									
Sewerage for own use	2. Gross fixed capital formation (Monetary units)	Largest numbers for sewerage may be expected for manufacturing and mining.									
wera	3. Stocks of fixed assets (Monetary units)	manufacturing and mining.									
Se	4. Return of treated water (Physical units)										



#### Data sources

- National accounts
- Businesses reports
  - Annual reports, environmental reports, websites
- Government
  - Agency reporting and websites
  - Administrative data bases (especially tax)
- Surveys
  - Business surveys
  - Agricultural surveys
  - Household surveys
- Estimation based on case studies, other research and assumptions

















### Combined presentations

## Interest lies mainly in linking abstraction and use of water in physical terms with:

- output and value added by industry
- total final consumption of households
- → Allows derivation of consistent indicators for evaluating the impact on water resources of changes in the economy due, for example, to changes in economic structure.
- → Using combined account in economic models permits he analysis or possible trade-offs between alternative water policies and economic strategies.
- → Several ways of combining the data (e.g. hybrid account for supply and use of water or water core tables).

















### **SEEA Core Tables**

- Core tables provide concise, highly relevant information
- Information is key to deriving indicators and aids in developing evidence based public policies
- UNSC at its 44th session (February 2013) urged UNCEEA to develop a core set of tables and accounts
- Core tables are being developed for:
  - Water accounting
  - Energy accounting
  - MFA and waste accounting
  - Air emission accounting
  - Land accounting
  - Forest accounting
  - Environmental Protection Expenditures Accounting
  - Environmental Goods and Services Sector
  - Environmental taxes and subsidies

















### 3 functions of core tables

- 1. For **compilers** they provide an overview of the end result of their compilation efforts and help them in deciding what core accounts to compile first.
- 2. For **users of the accounts** (i.e. researchers, policymakers, etc.) they present an overview of the key data and indicators that can be derived from the accounts
- 3. For **international agencies** they can be used as a starting point in the development of common reporting tables and development of global databases



### Core Table 1

#### **Core table 1** is composed of 3 core accounts:

- First block contains information on supply and use for water products in monetary terms
- Information is part of the monetary supply and use table for water which contains more details
- National accounts data can be used to populate table

			Industrie	es (by ISIC l	Division)			Taxes less subsidies on products, trade		al final mption	
	ISIC 01- 03	ISIC 05-33, 41-43	ISIC 35	ISIC 36	ISIC 37	ISIC 38,39, 45- 99	Total	and transport margins	Households	Government	Total
Supply of water products (Currency units)											
Natural water	L.1.1	L.1.1	L.1.1	L.1.1	L.1.1	L.1.1	L.1.1	M.1.1.1- [N.1.1.1+N.1.2.1]			L.1.1+M.1.1.1- [N.1.1.1+N.1.2.1]
Sewerage services	L.1.2	L.1.2	L.1.2	L.1.2	L.1.2	L.1.2	L.1.2	M.1.1.2- [N.1.1.2+N.1.2.2]			L.1.2+M.1.1.2- [N.1.1.2+N.1.2.2]
Total supply of products											
Intermediate consumption and final use (Currency units)											
Natural water	L.4.1	L.4.1	L.4.1	L.4.1	L.4.1	L.4.1	L.4.1		N.1.1.1+N. 1.2.1	N.1.1.1+N. 1.2.1	2.1 L.4.1+N.1.1.1+N.1.
Sewerage services	L.5.1	L.5.1	L.5.1	L.5.1	L.5.1	L.5.1	L.5.1		N.1.1.2+N. 1.2.2	N.1.1.2+N. 1.2.2	. L.5.1+N.1.1.2+N.1. 2.2
Other products											
Gross value added (Currency units)											4



















#### Core Table 1

- Second block contains information on physical supply and use of water
- Information is part of the physical supply and use table for water which contains more details

			Industrie	s (by ISIC	Division)		Rest of	Rest of Taxes less subsidies		ıl final		
								the world	on products, trade _	consu	mption	
	ISIC 01- 03	ISIC 05-33, 41-43	ISIC 35	ISIC 36	ISIC 37	ISIC 38,39, 45- 99	Total industry		and transport margins	Households	Government	Total
Use of water (Millions m3)												
Total Abstraction	Е	E	Е	Е	E	Е	Е			E		Е
of which: Abstraction for own use	E.a	E.a	E.a	E.a	E.a	E.a	E.a			E.a		E.a
Use of water received from other economic units	G	G	G	G	G	G	G	F.2+F.4		G		G+F.2+F.4
of which: Wastewater	G.3	G.3	G.3	G.3	G.3	G.3	G.3					
Supply of water (Millions m3)												
Supply of water to other economic units	F	F	F	F	F	F	F	G.2+G.4				F+G2+G4
of which: Wastewater	F.3	F.3	F.3	F.3	F.3	F.3	F.3					
Total returns	Н	Н	Н	Н	Н	Н	Н			Н		Н
Water consumption (Millions m3)												

















### Core Table 1

- Third block contains monetary information on water related assets
- Information is relevant for a more complete understanding of the investment needs in the water sector

			Industrie	s (by ISIC l	Division)			Rest of Taxes less subsidies	Actı	ual final	
								_ the world on products, trade _	cons	umption	
	ISIC 01-	ISIC 05-33,	ISIC 35	ISIC 36	ISIC 37	ISIC	Total	and transport		Ħ	
	03	41-43				38,39, 45-	industry	margins	olds	ner	
						99			seho	in	_
									sno	0.V6	otal
									=		E
Gross fixed capital formation (Currency units)											
For water supply	P.1.1	P.1.1	P.1.1	P.1.1	P.1.1	P.1.1	P.1.1				P.1.1
For water sanitation	P.1.2	P.1.2	P.1.2	P.1.2	P.1.2	P.1.2	P.1.2				P.1.2
Closing Stocks of fixed assets for water supply (Currency units)	0.1.1	0.1.1	0.1.1	0.1.1	0.1.1	0.1.1	0.1.1				0.1.1
Closing Stocks of fixed assets for water sanitation (Currency units)	0.1.2	0.1.2	0.1.2	0.1.2	0.1.2	0.1.2	0.1.2				O.1.2



















## Core Table 1: putting it all together

			Industrie	es (by ISIC	Division)				Taxes less subsidies on products, trade	ial final umption		
	ISIC 01- 03	ISIC 05-33, 41-43	ISIC 35	ISIC 36	ISIC 37	ISIC 38,39, 45- 99	Total industry		and transport margins	Households	Government	Total
Supply of water products (Currency units)												
Natural water	L.1.1	L.1.1	L.1.1	L.1.1	L.1.1	L.1.1	L.1.1		M.1.1.1- [N.1.1.1+N.1.2.1]			L.1.1+M.1.1.1 [N.1.1.1+N.1.2
Sewerage services	L.1.2	L.1.2	L.1.2	L.1.2	L.1.2	L.1.2	L.1.2		M.1.1.2- [N.1.1.2+N.1.2.2]			L.1.2+M.1.1.2 [N.1.1.2+N.1.2
Total supply of products												
Intermediate consumption and final use (Currency units)												
Natural water	L.4.1	L.4.1	L.4.1	L.4.1	L.4.1	L.4.1	L.4.1			N.1.1.1+N 1.2.1	I. N.1.1.1+N. 1.2.1	L.4.1+N.1.1.1+N 2.1
Sewerage services	L.5.1	L.5.1	L.5.1	L.5.1	L.5.1	L.5.1	L.5.1			N.1.1.2+N 1.2.2	I. N.1.1.2+N. 1.2.2	L.5.1+N.1.1.2+N 2.2
Other products												
Gross value added (Currency units)												
Employment												
Use of water (Millions m3)			T.							-		P
Total Abstraction	Е	E	E	Е	Е	E	Е			Е		Е
of which: Abstraction for own use	E.a	E.a	E.a	E.a	E.a	E.a	E.a	E C · E ·		E.a		E.a
Use of water received from other economic units	G	G	G	G	G	G	G	F.2+F.4		G		G+F.2+F.4
of which: Wastewater	G.3	G.3	G.3	G.3	G.3	G.3	G.3					
Supply of water (Millions m3)	E	E	F	F	E	Е	E	G.2+G.4		_		F+G2+G4
Supply of water to other economic units of which: Wastewater	F F.3	F F.3	F.3	F F.3	F F.3	F F.3	F	G.2+G.4				F+G2+G4
Total returns	F.3 H	F.3 H	F.3 H	F.3 H	F.3 H	F.3 H	F.3 H			Н		Н
Water consumption (Millions m3)	11	11	11	11	11	11	11			11		11
Gross fixed capital formation (Currency units)												
For water supply	P.1.1	P.1.1	P.1.1	P.1.1	P.1.1	P.1.1	P.1.1					P.1.1
For water sanitation	P.1.2	P.1.2	P.1.2	P.1.2	P.1.2	P.1.2	P.1.2					P.1.2
Closing Stocks of fixed assets for water supply (Currency units)	0.1.1	0.1.1	0.1.1	0.1.1	0.1.1	0.1.1	0.1.1					0.1.1
Closing Stocks of fixed assets for water sanitation (Currency units)	0.1.2	0.1.2	0.1.2	0.1.2	0.1.2	O.1.2	0.1.2					0.1.2
The second second	. 0	000	800			7 =		ПШ	_			





### Core Table 2: = Water Asset Account

						Type of water resource			Total
					Surface w	vater	Groundwater	Soil water	
			Artificial	Lakes	Rivers	Glaciers, snow and ice			
Addition	ns to stock								
	Returns		H.1.1.1	H.1.1.2	H.1.1.3	H.1.1.4	4 H.1.2	2	Н
	Precipitat	tion	B.1	B.1	B.1	B.1	1	B.1	B.1
	Inflows f	from other territories	B.2.1	B.2.1	B.2.1	B.2.1	1 B.2.1	1	B.2.1
	Inflows f	from other inland water resources							D
İ	Discover	ries of water in aquifers							
Reduction	ons in stock	k							•
	Abstraction	on	E.1.1.1	E.1.1.2	E.1.1.3	E.1.1.5	5 E.1.2	2 E.1.3	Е
		for hydro power generation							E.a.a
		for cooling water							E.a.e
	Evaporat <sup>;</sup>	tion & actual evapotranspiration	C.1	C.1	C.1	C.1	1	C.1	C.1
	Outflows	s to other territores			C.2.1	C.2.1	1 C.2.1	1	C.2.1
	Outflows	s to the sea			C.2.2	C.2.2	2 C.2.2	2	C.2.2
	Outflows	s to other inland water resources							D

### Changes in stocks



















### **Core Tables and Indicators**

Core tables contain the necessary information for deriving numerous indicators on water, e.g.:

- Total renewable water resources
- Total abstractions by industry
- Intensity of use of water resources
- Water productivity/intensity indicators
- Investments in water infrastructure



















Thank you for your attention!

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