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Introduction to the System of Environmental-Economic Accounting for Water

EMWIS

Expert Workshop on Metadata Management & Referential Data Sets
Nice, 9 June 2009

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Why an accounting approach?

- Encourages the adoption of standards
- Introduces accounting concepts to environmental statistics
- Improves both economic and environmental statistics by encouraging consistency
- Implicitly defines ownership and hence responsibility for environmental impacts
- Encourages the development of comprehensive data sets
- Facilitates international comparisons



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Strengths of the accounting approach

- Organised body of information facilitates integrated economic-environmental analysis (complements sustainable development indicators, modelling)
- Comprehensive and consistent, routinely produced
- Provides a system into which monetary valuations of environmental costs can be incorporated

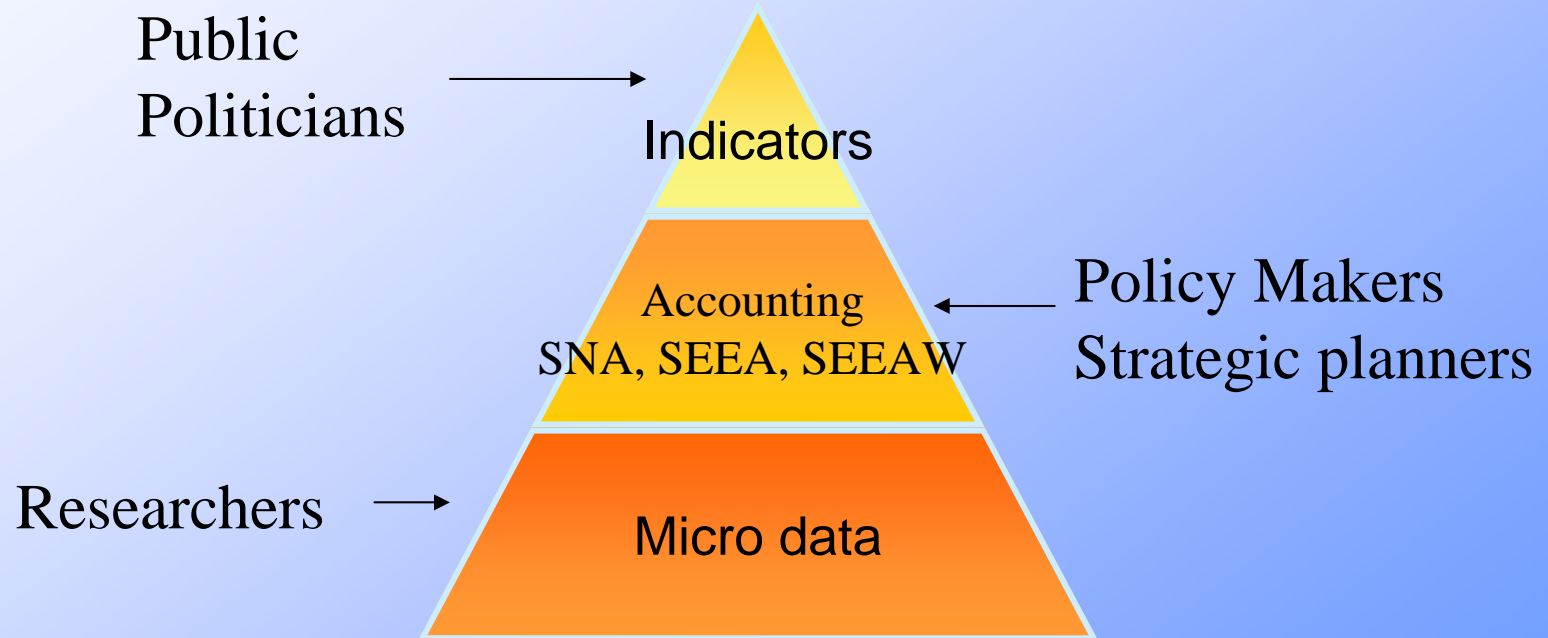


44 Countries with water accounts

- Andorra
- Australia
- Austria
- Bahamas
- Botswana
- Canada
- China
- Colombia
- Denmark
- Dominican Republic
- Egypt
- France
- Germany
- Guatemala
- Hungary
- Iraq
- Israel
- Italy
- Jordan
- Mexico
- Namibia
- Netherlands
- New Zealand
- Peru
- Philippines
- Portugal
- Singapore
- South Africa
- Spain
- Sweden
- Switzerland
- Trinidad and Tobago
- Ukraine
- Armenia
- Estonia
- Greece
- Lebanon
- Mauritius
- Norway
- Occupied Palestinian Territory
- Romania
- Tunisia
- Turkey
- United Kingdom



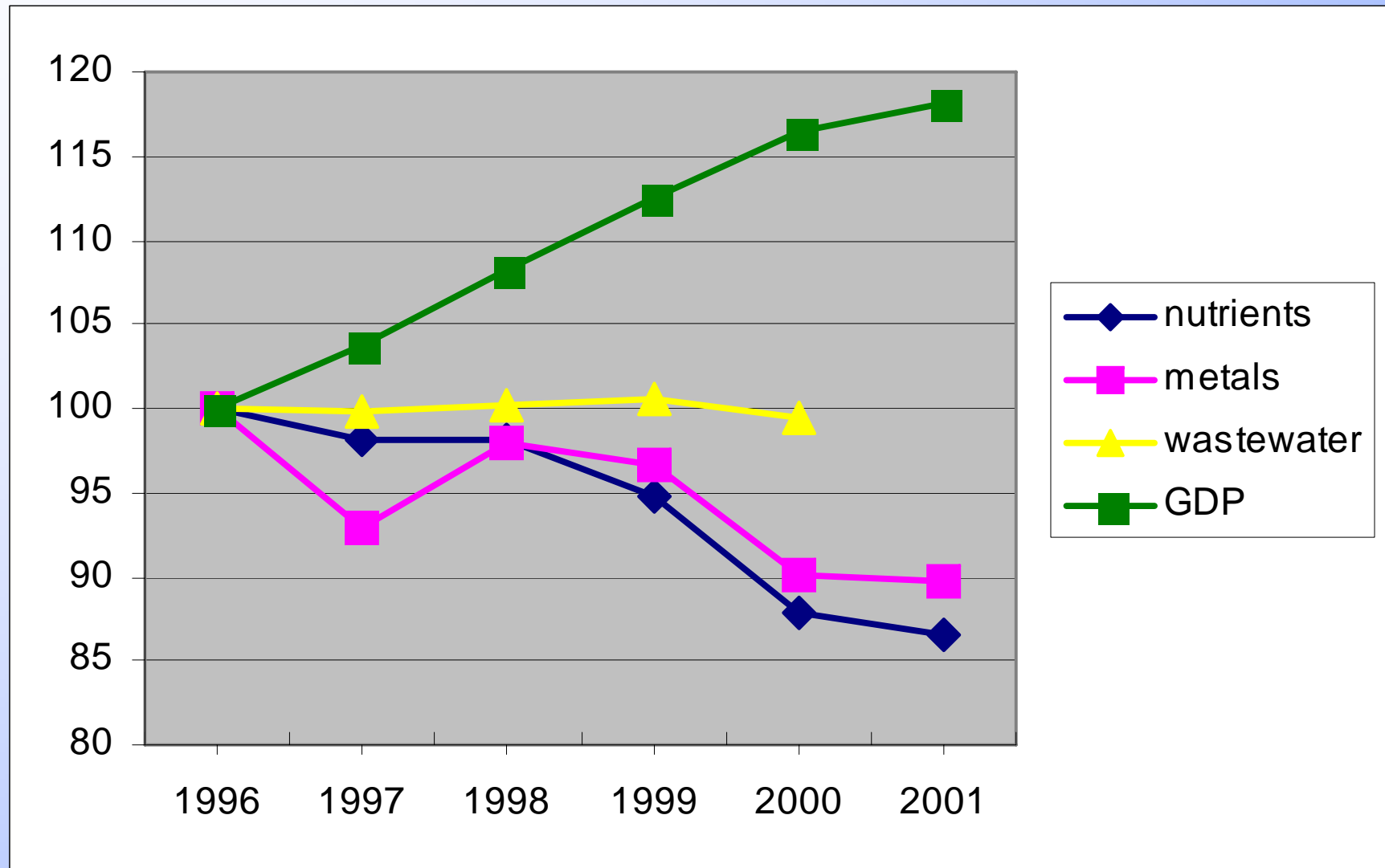
Audiences for information





Indicators: economic growth and water pollution

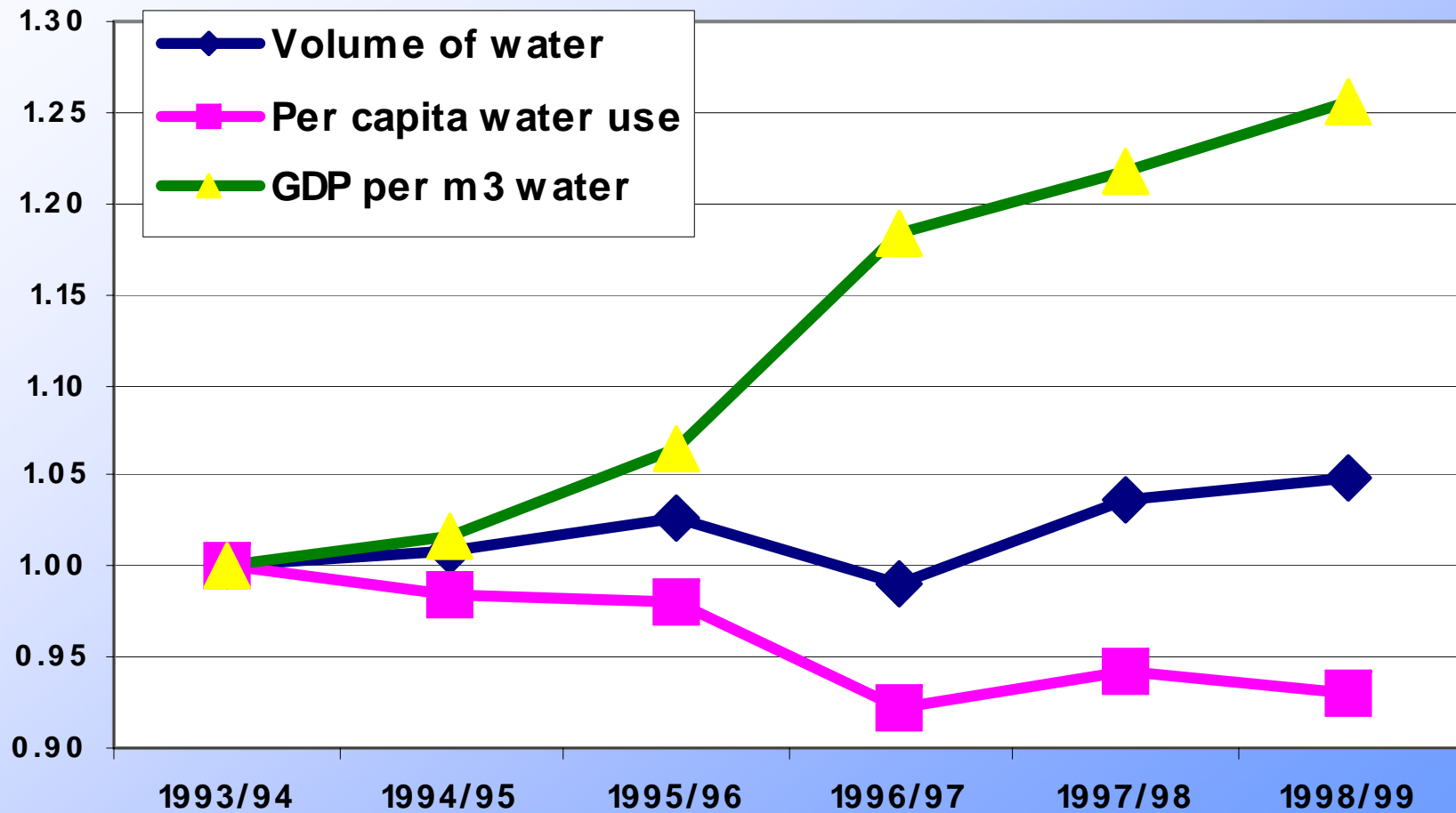
Netherlands: water pollution and economic growth, 1999-2001





Indicators: economic growth and water use

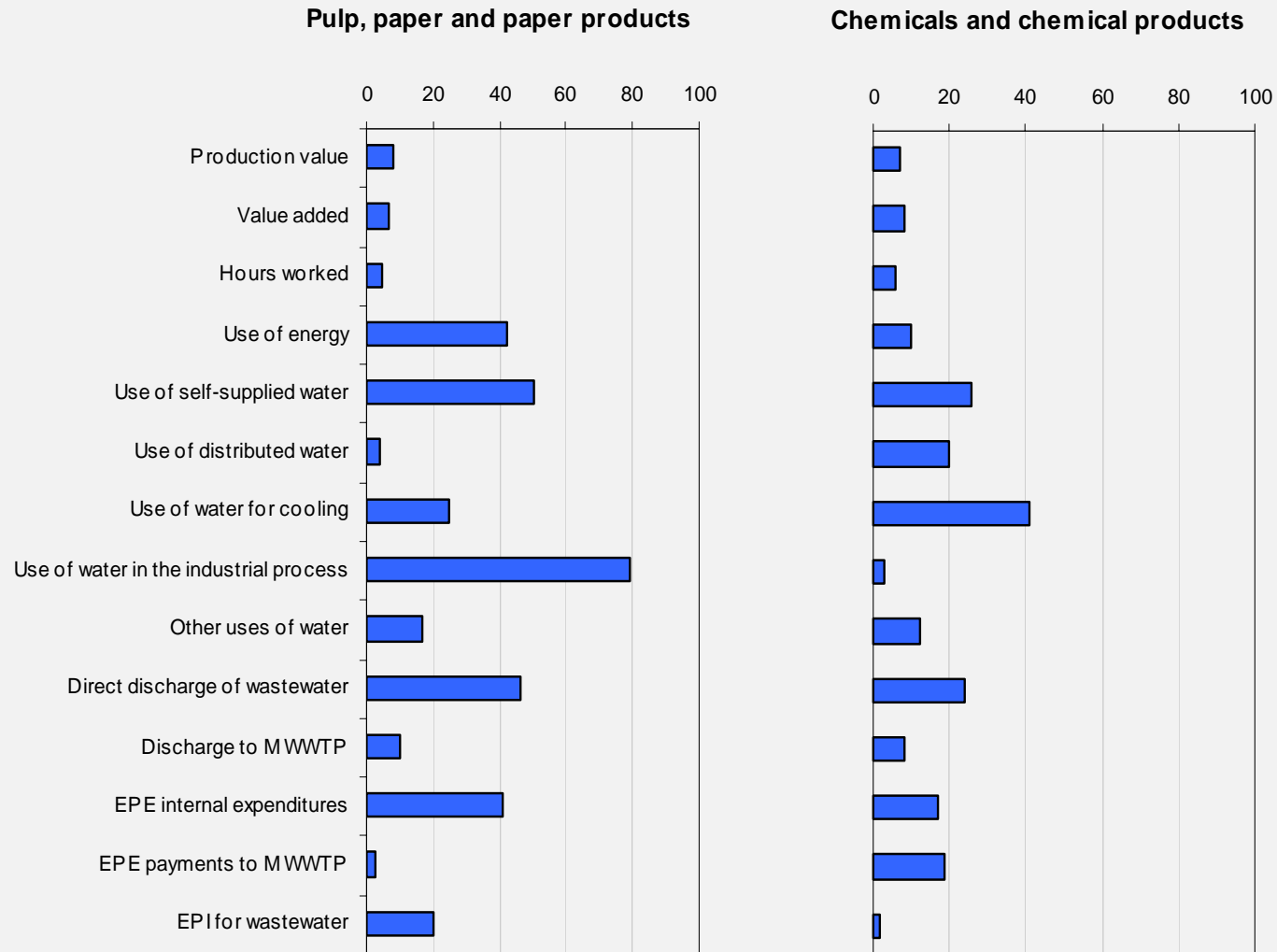
Botswana: water use and economic Growth, 1993-1998





Environmental Economic Profiles Sweden 1995

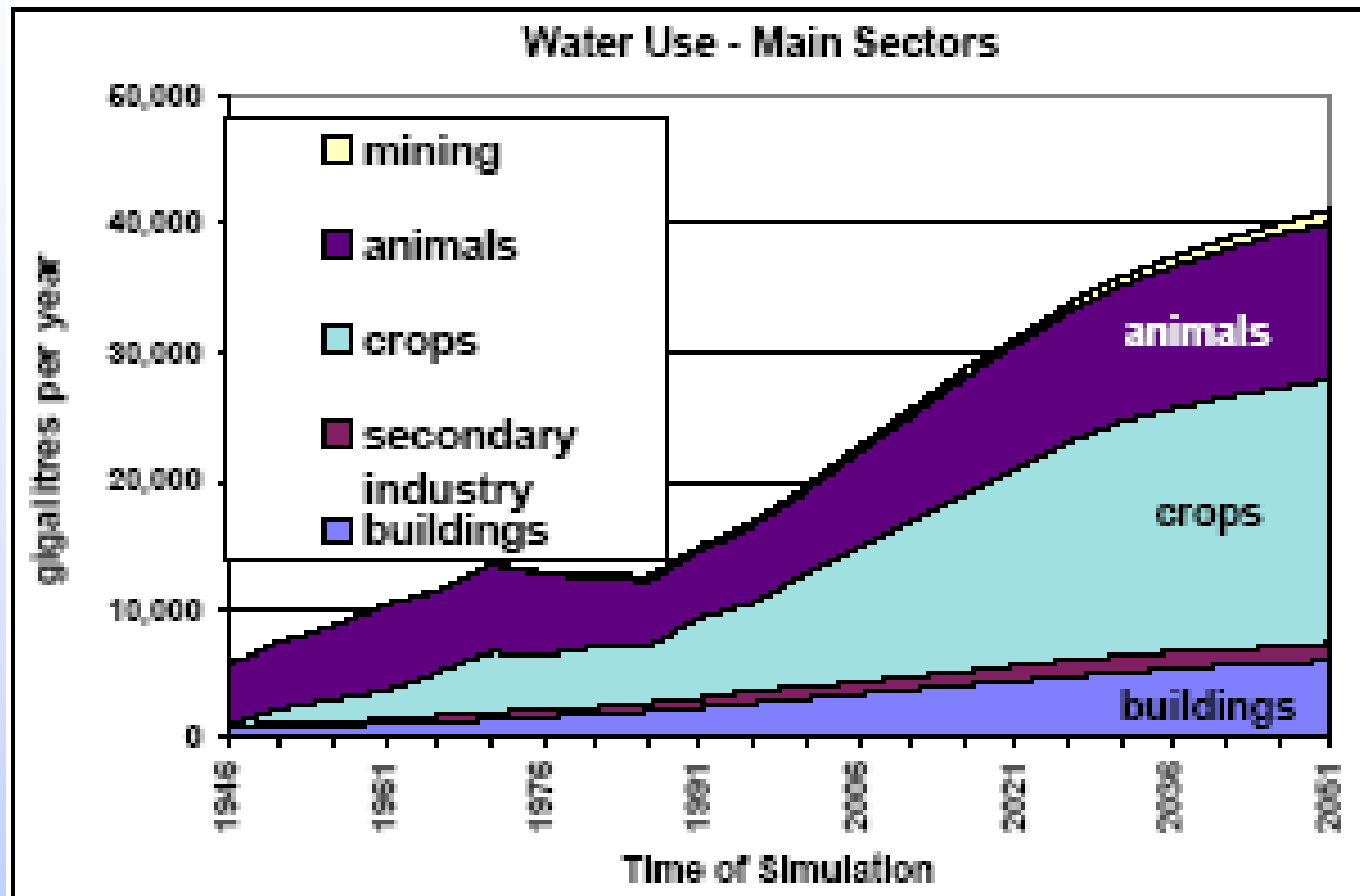
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Projecting future water demands Australia 2050

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Modelling Effects of Price Changes: Murray-Darling River Basin Australia

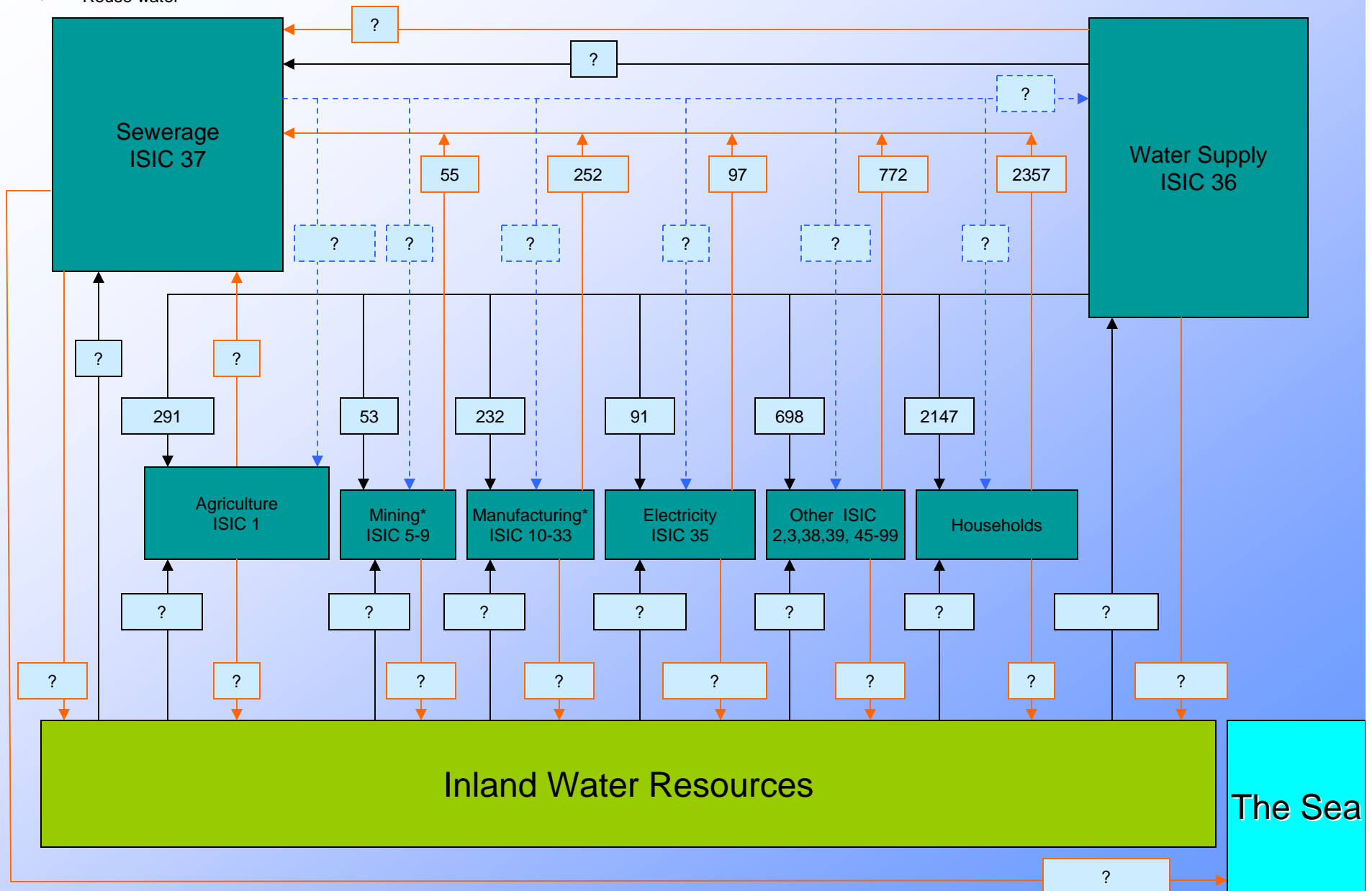
Based on historical water use & price data, simulated impact on GDP of doubling water prices and the expected increases in water use efficiency (WUE) of 1-2%

	Increase in GDP, A\$million	
	1% increase WUE	2% increase WUE
Irrigated agriculture	-24	78
Dryland agriculture	-51	-112
Food and fibre processing	44	97
Other industries	262	410
Total impact on GDP	253	521

Key

- Wastewater
- Water
- Reuse water

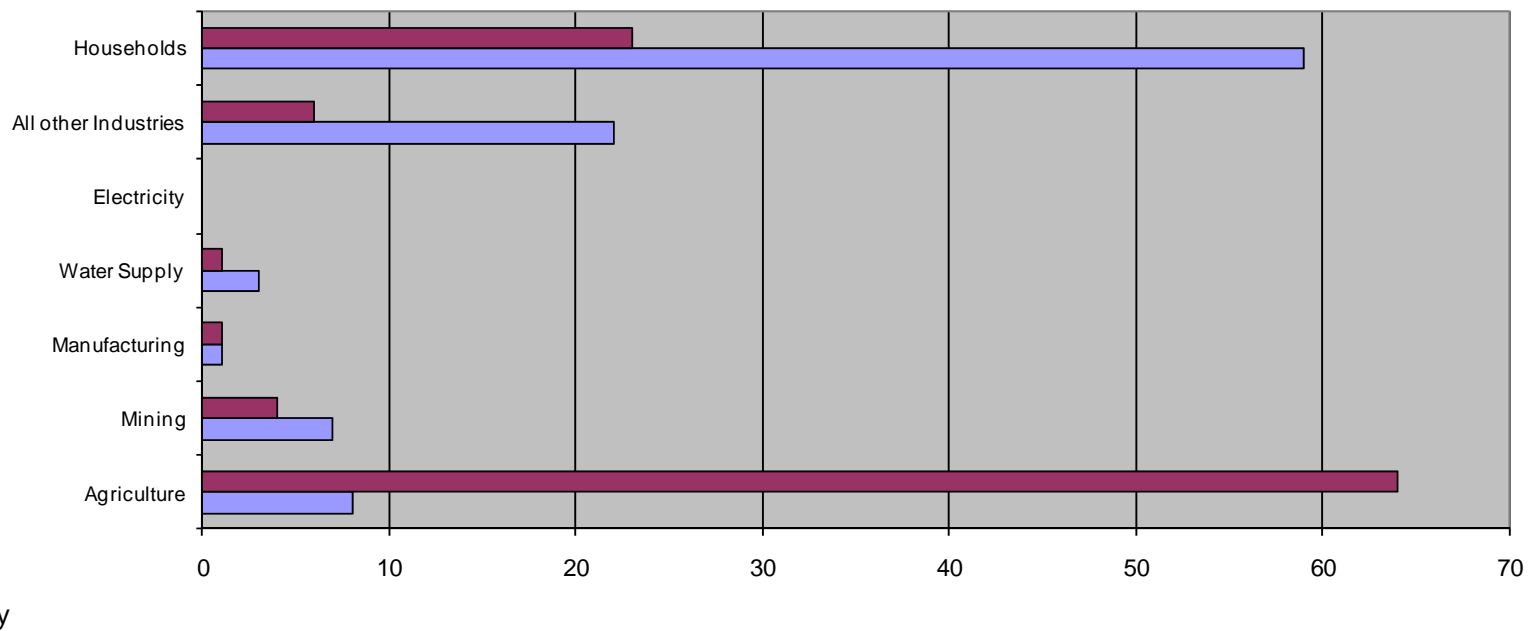
Australia – monetary water supply and use, 2004-05 (million AUD\$)



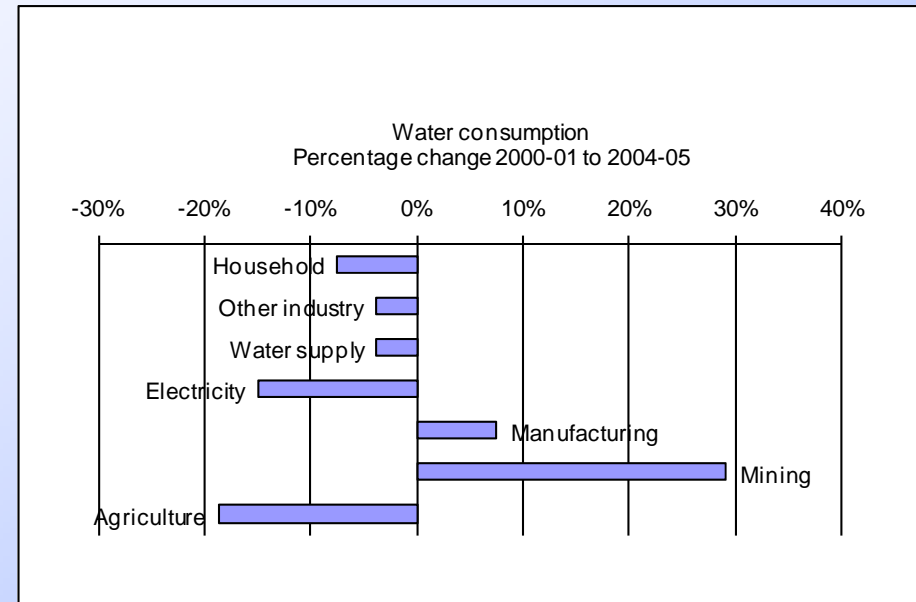
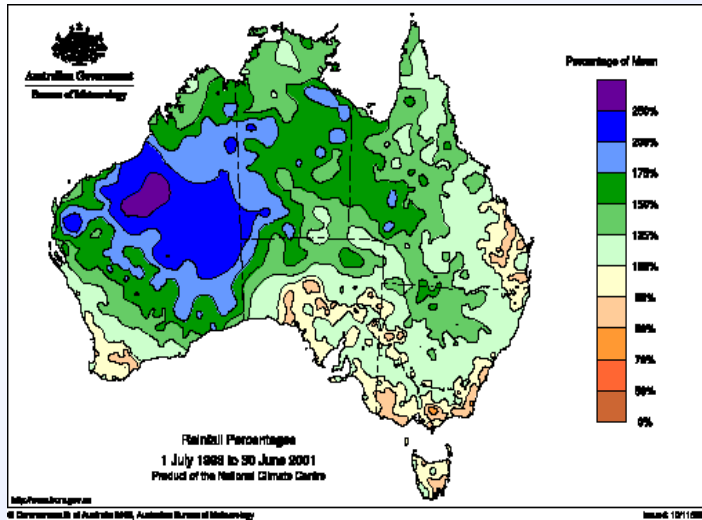
* Note shown is the supply of distributed water and reuse water by mining and manufacturing, 25 GL in total. No monetary available for these.



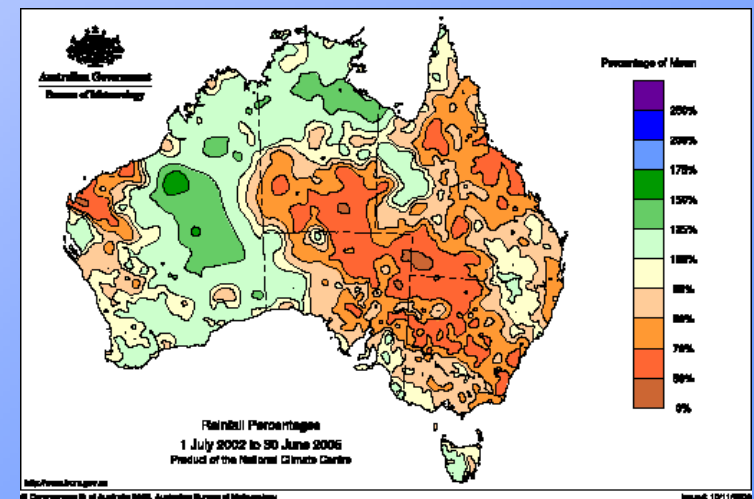
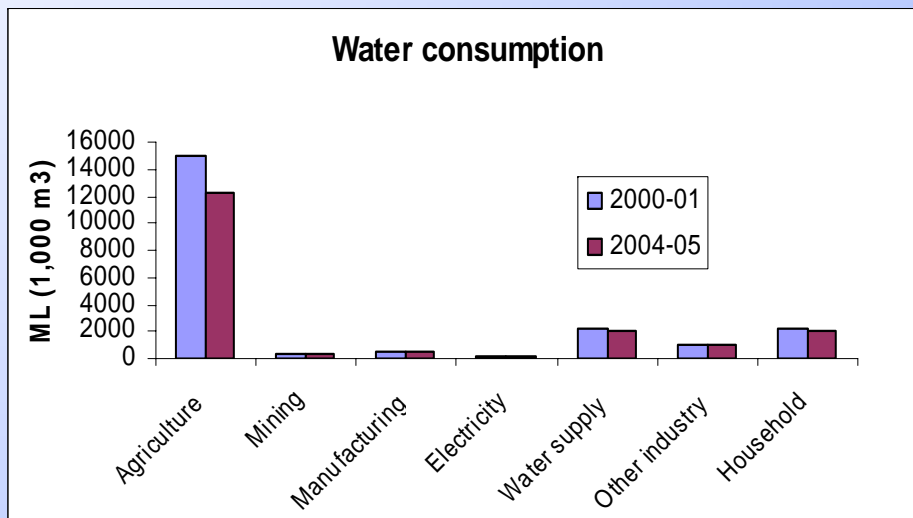
Monetary v physical use of distributed water (% of total use)



Percentage of mean annual rainfall 1998-99 to -2000-01



Percentage of mean annual rainfall 2002-03 to -2004-05





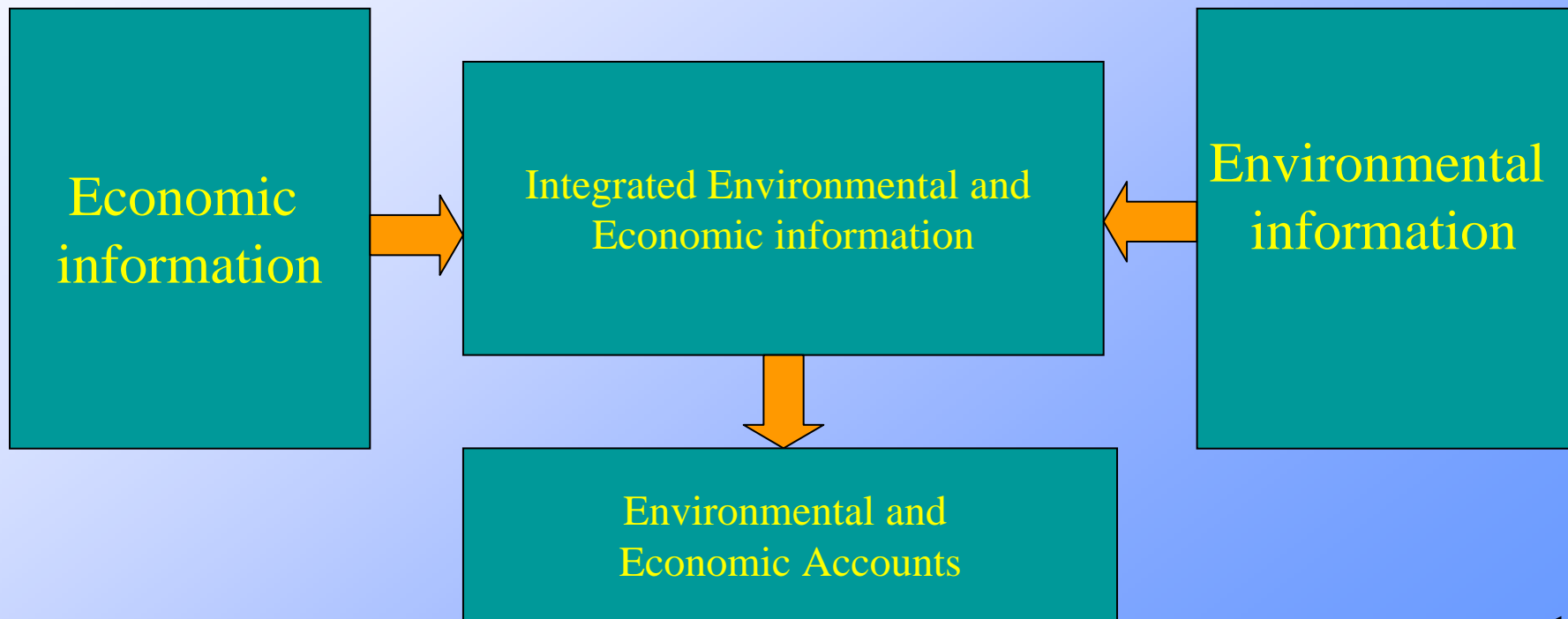
Keys concepts of SEEA

	Stocks	Flows
Volume (e.g. tonnes, m ³)		
Value (e.g. \$, £, ¥, €)		



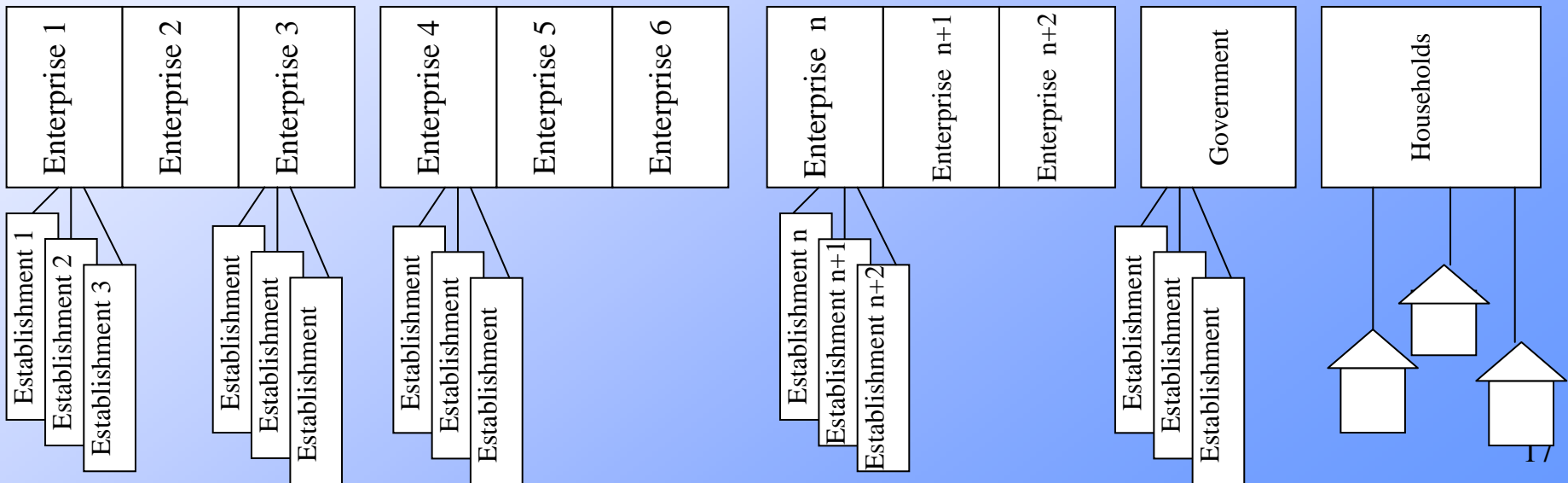
Environmental-economic accounting

- Brings together economic and environmental information





Units of the economy





Enterprises

Definition

- An institutional unit in its capacity as a producer of goods and services is known as an enterprise. An enterprise is an economic transactor with autonomy in respect of financial and investment decision-making, as well as authority and responsibility for allocating resources for the production of goods and services. It may be engaged in one or more economic activities at one or more locations. An enterprise may be a sole legal unit.

<http://unstats.un.org/unsd/isdts/docs/StatisticalUnits.pdf>



Establishments

Definition

- The establishment is defined as an enterprise or part of an enterprise that is situated in a single location and in which only a single productive activity is carried out or in which the principal productive activity accounts for most of the value added.
- In other words, an establishment can be defined, ideally, as an economic unit that engages, under a single ownership or control - that is, under a single legal entity – in one, or predominantly one, kind of economic activity at a single physical location - for example, a mine, factory or workshop.

<http://unstats.un.org/unsd/isdts/docs/StatisticalUnits.pdf>



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Industrial Classification – what is an industry?

- An industry is a grouping of establishments engaged in the same or similar kinds of activities
- The classification used in national accounts and water accounts is the International Standard Industrial Classification (ISIC)



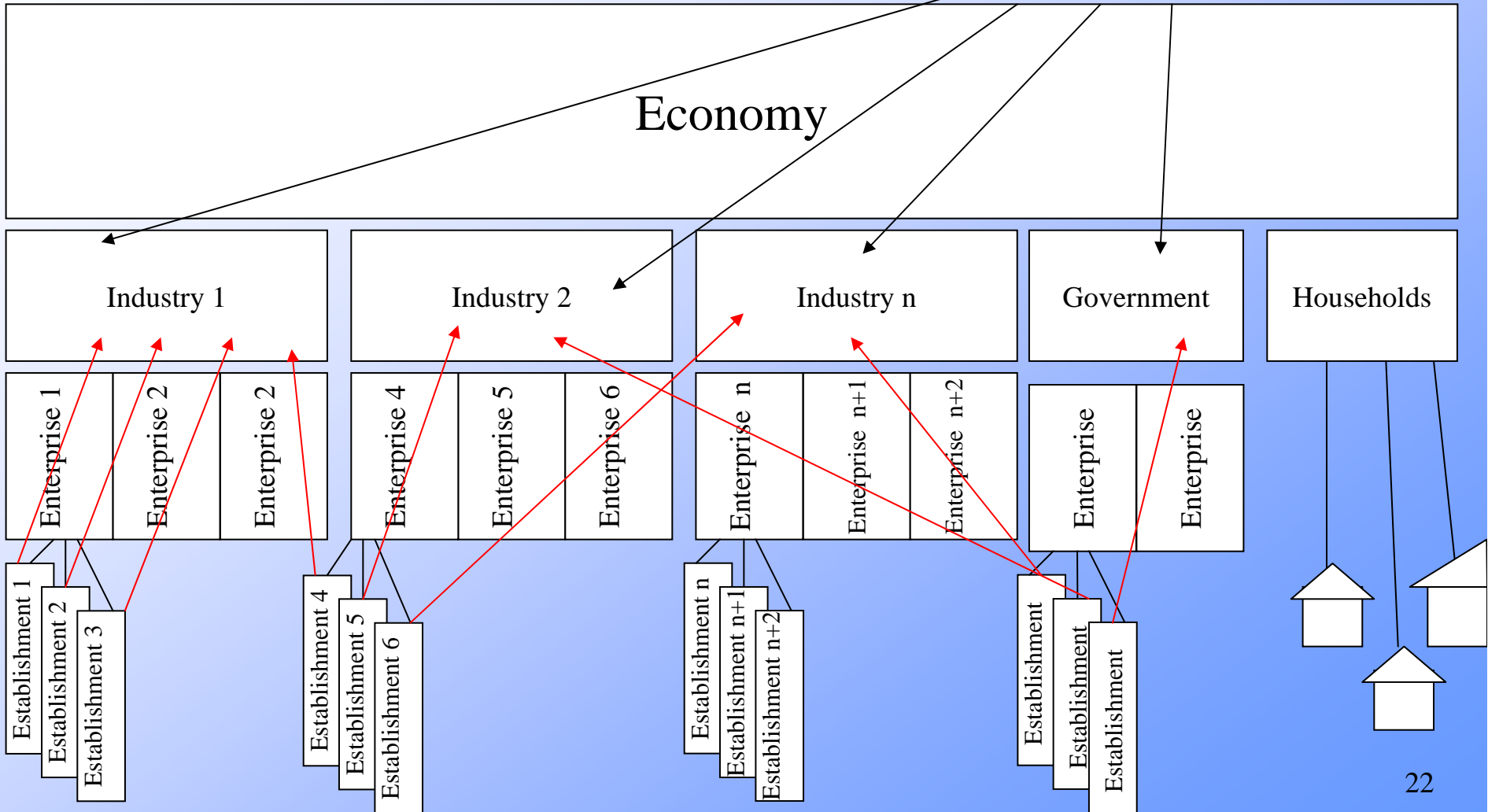
ISIC – International Standard Industrial Classification

- Enterprises and establishments are classified using ISIC Revision 4 according to the goods and services they produce
<http://unstats.un.org/unsd/cr/registry/default.asp>
- Sometimes all establishments of an enterprise are classified to the same ISIC code
- Sometimes establishments of the one enterprise are classified to different ISIC classes.
- EU uses NACE (Nomenclature statistique des activités économiques dans la Communauté européenne) – fully compatible with ISIC



Units and industry classification

International Standard Industrial Classification





SEEA Water – an interim international statistical standard

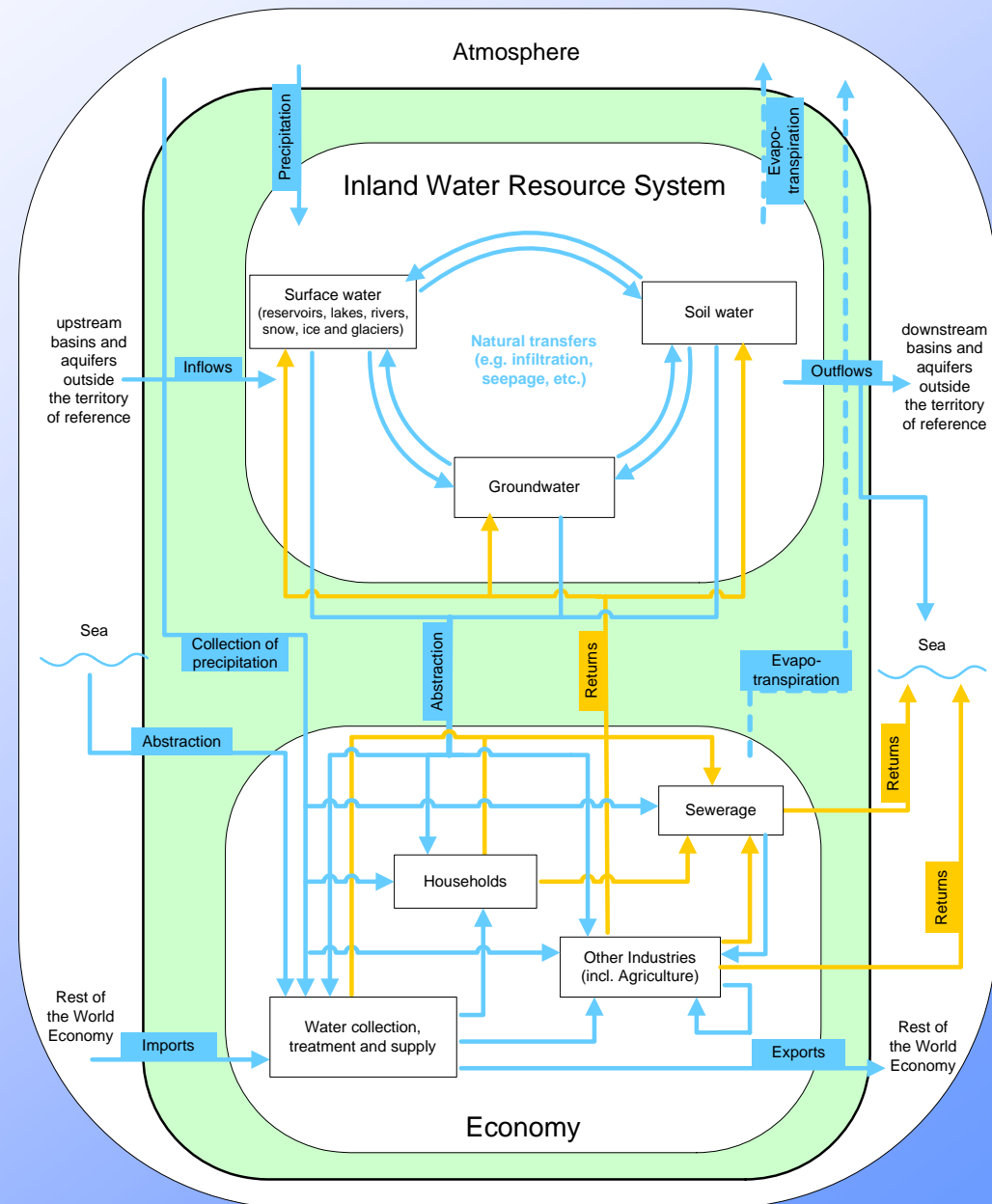
- Part 1 of SEEA Water was adopted by the United Nations Statistical Commission in March 2007 as an interim statistical standard
- Part 2 contains the elements of SEEA Water for which there is less country experience and there is still some debate
- SEEA Water has been recognized as useful by the users of information



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SEEA Water Overview

- Stocks and flows
- Economy and environment





SEEW - Structure

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9 Chapters, 2 parts:

- Part 1
 - Ch 1. Introduction
 - Ch. 2 Water Accounting Framework
 - Ch. 3 Physical Supply and Use Tables
 - Ch. 4 Emission Accounts
 - Ch. 5 Hybrid and Economic Accounts
 - Ch. 6 Asset Account
- Part II
 - Ch. 7 Quality Account
 - Ch. 8 Valuation
 - Ch. 9 Policy use



12 Standard Tables

1. Physical use
2. Physical supply
3. Gross and net emissions
4. Emissions by ISIC 37
5. Hybrid (Monetary and Physical) supply
6. Hybrid use
7. Hybrid supply and use
8. Hybrid water supply and sewerage for own use
9. Government accounts for water related collective consumption services (Monetary)
10. National expenditure for waste management (Monetary)
11. Financial accounts for waste water management (Monetary)
12. Asset account (Physical)

12 Supplementary tables



Physical water use: Standard Table I

Physical units

		Industries (by ISIC categories)						Hou seh olds	Res t of the wor ld	Tot al
		1	2- 33, 41- 43	35	36	37	38,3 9, 45- 99			
From the environme nt	U1 - Total abstraction (=a.1+a.2= b.1+b.2):									
	a.1- Abstraction for own use									
	a.2- Abstraction for distribution									
	b.1- From water resources:									
	Surface water									
	Groundwater									
	Soil water									
b.2- From other sources										
Collection of precipitation										
Abstraction from the sea										
Within the economy	U2 - Use of water received from other economic units									
U=U1+U2 - Total use of water										



Physical water supply: Standard Table II

Physical units

		Industries (by ISIC categories)						Hou seh olds	Rest of the worl d	Tot al
		1	2- 33, 41- 43	35	36	37	38,3 9, 45- 99			
Within the economy	S1 - Supply of water to other economic units <i>of which:</i> Reused water Wastewater to sewerage									
To the environment	S2 - Total returns (= d.1+d.2) d.1- To water resources Surface water Groundwater Soil water d.2- To other sources (e.g. Sea water)									
S - Total supply of water (= S1+S2)										
Consumption (U - S)										



Water emissions: Standard Table III

Physical units

Pollutant	Industries (by ISIC categories)					Total	Households	Rest of the world	Total
	1	2-33, 41-43	35	36	38, 39, 45-99				
Gross emissions (= a + b)									
a. Direct emissions to water (= a1 + a2 = b1 + b2)									
a1. Without treatment									
a2. After on-site treatment									
<i>b1. To water resources</i>									
<i>b2. To the sea</i>									
b. To Sewerage (ISIC 37)									
d. Reallocation of emission by ISIC 37									
e. Net emissions (= a. + d.)									



Hybrid water use: Standard Table VI

Physical and monetary units

	Intermediate consumption of industries (by ISIC categories)							Actual final consumption				Capital formation	Exports	Total uses at purchaser's price	
	1	2-33, 41-43	35		36	37	38, 39, 45-99	Total industry	Households						Government
			Total	of which: Hydro					Final consumption expenditure	Social transfers in kind from Government and NPISHs	Total				
Total intermediate consumption and use (monetary units) <i>of which:</i> Natural water (CPC 1800) Sewerage services (CPC 941) Total value added (monetary units)															
Total use of water (physical units) U1 - Total Abstraction <i>of which:</i> a.1- Abstraction for own use U2 - Use of water received from other economic units															



Physical water assets: Standard Table XII

physical units

	EA.131 Surface water				EA.132 Groundwater	EA.133 Soil water	Total
	EA.1311 Reservoirs	EA.1312 Lakes	EA.1313 Rivers	EA.1314 Snow, Ice and Glaciers			
Opening Stocks							
Increases in stocks							
Returns from the economy							
Precipitation							
Inflows							
from upstream territories							
from other resources in the territory							
Decreases in stocks							
Abstraction							
<i>of which</i> Sustainable use							
Evaporation/Actual evapotranspiration							
Outflows							
to downstream territories							
to the sea							
to other resources in the territory							
Other changes in volume							
Closing Stocks							
							31



Supplementary tables and further disaggregation of data items

- The 12 SEEAW standard tables are the minimum data that countries are encouraged to compile
- Supplementary tables are presented
- Data items and industries can be further disaggregated



UNSD – current work on water accounts and water statistics

- Developing International Recommendations for Water Statistics
- Developing training materials
- Conducting training courses
- Assisting countries with implementation via:
 - Country missions
 - Telephone and email
- Work with other partners e.g. UN regional commissions and other UN agencies, Medstat, OECD, Eurostat, World Bank, Asian Development Bank.



International Recommendations for Water Statistics (IRWS)

- UNSD is developing IRWS
- The IRWS will define and support the compilation of basic statistical data to support the SEEAW and the water indicators used by international agencies (e.g. the FAO, World Bank and UN MDGs)
- It will provide information on the concepts, sources and methods needed for basic water statistics
- It will also provide practical guidance on the compilation of water accounts and indicators
- An expert group meeting is has discussed the draft



Links to European Processes

- **Eurostat work programme 2009:** *Environmental accounts are being developed and data is being collected. Environmental accounts can act as a tool for monitoring the overall development of the thematic strategy for the sustainable use of natural resources and the action plan on “Sustainable consumption and production and sustainable industrial policy”*
- **Environmental Accounting Implementation Plan:** *Eurostat will carry out a pilot study on the feasibility of compiling water accounts using the framework SEEA-Water approved in 2007 by the UNSC as an intermediate statistical standard. In 2008 Eurostat will, together with EEA, examine the use of this framework for the European reality. Based on this experience a methodology should be developed forming a basis for the compilation of European water accounts.*
- **Economic analysis according to EU-WFD**
- **Scarcity and Droughts**
- **Sustainable Development Indicators**

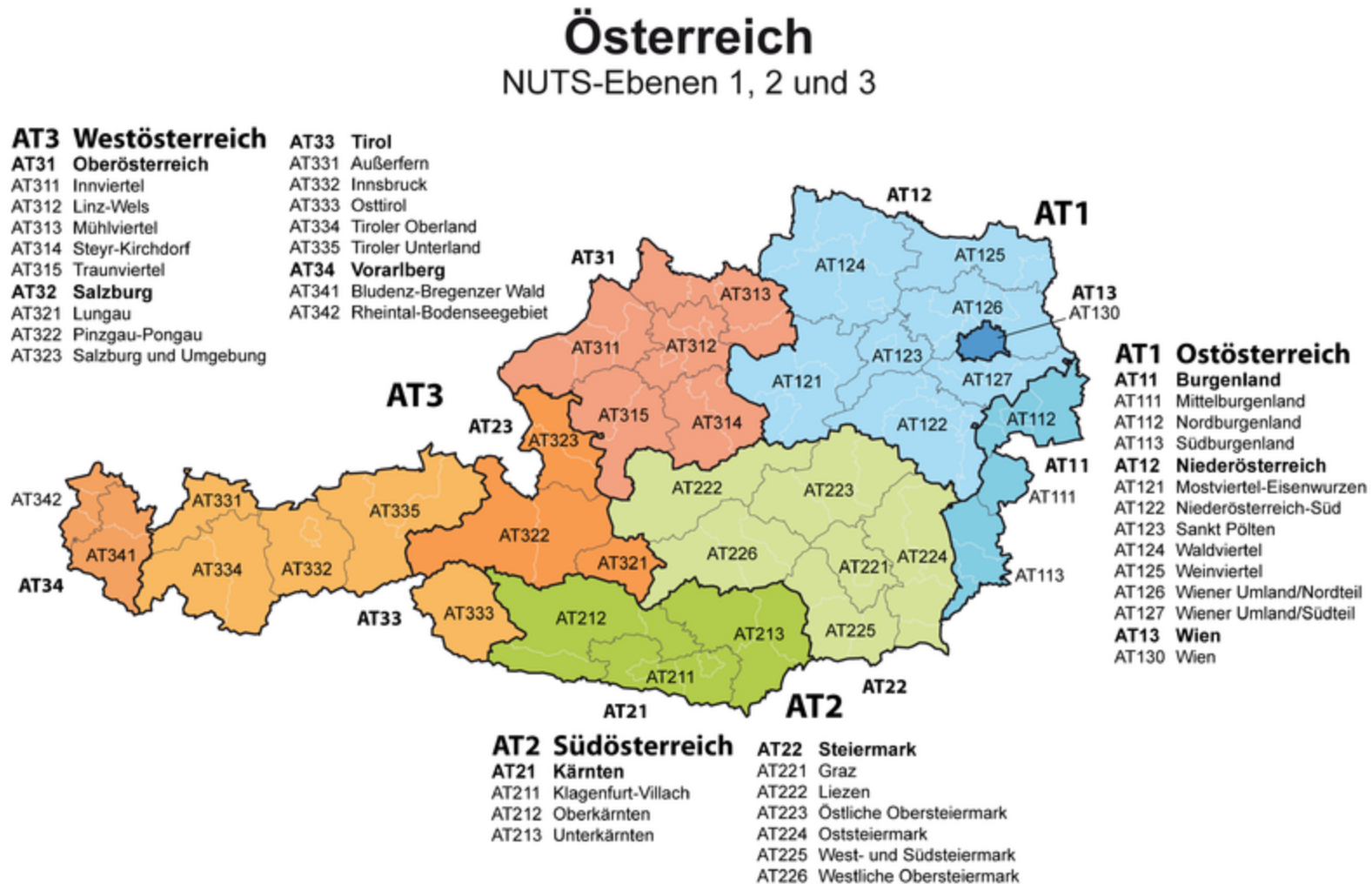


Codelists and Classifications

- Statistical units of the economy should be classified and delimited according to ISIC / NACE
- Terms and definitions used in water statistics are often not identical to those used in water management, e.g.:
 - cooling water
 - waste water
 - water use
 - water consumption
- Regions:
 - NUTS (Nomenclature of Territorial Units for Statistics)
 - Administrative regions
 - Hydrographical regions
- Temporal resolution



Example for NUTS Regions





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