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Sector Paper:

Water Collection, Treatment and Supply sector

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1.0 Introduction

Water is a precious resource that is essential to sustain life, economic development and ecosystems.

Growing populations, rapid urbanization, and competing demand for water for agriculture, energy, industrial, and domestic use pose global challenges in managing this scarce resource.

The *Water Collection, Treatment and Supply* sector incorporate activities related to the management including collection of water from various sources and distribution by various means for household and industrial needs. These activities are often carried out in connection with or by units that are also engaged in the treatment of sewerage.

Natural environments differ across countries. This can lead to different national practices depending on the quality and source of water availability. This sector paper summarises the experience of France, Sweden, Poland and Hungary from the Voorburg Group session in Warsaw 2012. As a result, it largely examines the sector from a European perspective.

The sector is generally a natural monopoly, and this usually results in it being run as a public service by a public utility which is owned by local or national government.

However, the organization of the industry, which tends to be highly regulated, differs across countries with varying levels of public and private sector involvement. Countries usually have one dominant traditional structure, which changes only gradually over time.

Local government operating the system through a municipal department, municipal company, or inter-municipal company is the most commonly observed structure worldwide. An increasing trend is for local governments to outsource some of the activities to the private sector.

National governments operate the water industry in some countries, usually small developing countries.

Private sector ownership exists in a small number of countries such as Hungary, England and Wales.

Co-operative ownership and related Non-Governmental Organisation structures also exist.

This paper summarises international progress and challenges in the measurement of turnover and price change, as well as classification issues in this sector. It's main objective is to recommend best practices so that countries developing or revising their own programs will have a benchmark or point of reference. The best approach for each country will however be influenced by resources within their National Statistical Institute, availability of data sources, the natural environment and market conditions in this particular sector in their country.

The main sources of information used in this paper are the presentations and discussions from the 27th Voorburg Group (VG) meeting, along with the results of the VG survey of country progress.

The paper is organized as follows: Section 2 covers some of the primary issues related to classification; Section 3 describes the availability of turnover data, approaches to the collection of this data and measurement issues arising; Section 4 outlines the extent to which Service Producer Price Index (SPPI) data is compiled for the sector, the sources and methodologies adopted and main issues surrounding price measurement. Section 5 gives a brief summary of the conclusions.

2.0 Classification

The *Water Collection, Treatment and Supply* sector comprises establishments involved in water collection, treatment and distribution activities for domestic and industrial needs.

It includes the collection of water from various sources such as rain water, lakes, rivers, wells and treatment for industrial and other purposes including desalination and purification. The distribution of water through mains, trucks and irrigation canals is also included however the provision of irrigation services through sprinklers, and similar agricultural support services, is not included. The sector also excludes

- operation of irrigation equipment for agricultural purposes
- treatment of wastewater in order to prevent pollution
- (long-distance) transport of water via pipelines

The classification of these services are reasonably standard from an international perspective however differences in both the content and level of detail can be found among the national and regional derivations of the United Nations (UN) industrial and product classifications.

2.1 Industry Classification

Three common industry classifications were considered at the 27th Voorburg Group meeting: the UN *International Standard Industrial Classification* (ISIC, Revision 4.0), the *Statistical Classification of Economic Activities in the European Community, Rev. 2* (NACE Rev. 2) and the *North American Industrial Classification System* (NAICS 2007).

The *Water Collection, Treatment and Supply* sector is classified in ISIC Section E which groups environment-related activities. There is no further breakdown of the classification 36 “*Water collection, treatment and supply*” below.

ISIC 4 Section E : Water supply, sewerage, waste management and remediation

36 “Water collection, treatment and supply”

37 “Sewerage”

38 “Waste collection, treatment and disposal activities; materials recovery”

39 “Remediation activities and other waste management services”

Appendix 1 shows the ISIC Rev.4 along with the European NACE and North American NAICS derivations of this classification. These international classifications are quite similar but different levels of detail can be observed. A number of EU countries have their own derivations of the NACE Rev.2 classification to meet their national requirements. The Swedish national classification, SNI is identical to NACE Rev.2 at the 4 digit level. It has a more detailed level of breakdown below the 4 digit level as illustrated below:

NACE Rev. 2	36.0	- Water collection, treatment and supply
SNI 2007	36.001	- Ground water supply
	36.002	- Surface water supply

2.2 Product classification

The product classifications presented here are the Central Product Classification v.2 (CPC v.2), Classification of Products by Activity (CPA 2008) and the North American Product Classification System (NAPCS v.1). See References for links to the relevant classifications. These product classifications differ as the overall structure of the CPC and NAPCS are based on characteristics and use of the good or service rather than their industry of origin.

The CPC v.2 has the following product level breakdown for water collection, treatment and supply:

Division & subclass	Sub-class	Description
18. Natural water	18000	Natural water
69. Electricity, gas and water distribution (on own account)	69210	Water distribution through mains (excl steam & hot water) on own account
	69230	Distribution of steam, hot water and air conditioning supply through mains (on own account)
	69230	Water distribution, except through mains (on own account)
86. Support services to agriculture, hunting, forestry, fishing, mining and utilities	86330	Water distribution services through mains (on a fee or contract basis)
	86340	Distribution services of steam, hot water and air-conditioning supply through mains (on a fee or contract basis)
	86350	Water distribution services, except through mains (on a fee or contract basis)

The CPA 2008 closely follows the structure of the ISIC Rev. 4 and Nace Rev.2 classifications:

Division	Category	Sub-category	Description
36. Natural water, water treatment and supply services	36.00.1		Natural water
		36.00.11	Drinking water
		36.00.12	Non-drinking water
	36.00.2	36.00.20	Treatment and distribution service of water through mains
	36.00.3	36.00.30	Trade services of water through mains

CPA product categories are related to activities as defined by the Statistical classification of economic activities in the European Community (NACE). Each CPA product, whether a transportable or non-transportable good or a service is assigned to one single NACE activity. This linkage to NACE activities gives the CPA a structure parallel to that of NACE at all levels.

3.0 Turnover Statistics

The *Water Collection, Treatment and Supply* sector is relatively small in its contribution to total national output. In Hungary for example, it contributes in the region of a half of one percent. France, Hungary, Poland and Sweden all reported the dominance of large firms in terms of the contribution to the total turnover of the sector.

3.1 Data availability

There is very good availability of annual industry level turnover for the *Water Collection, Treatment and Supply sector* based on country responses to the detailed summary report compiled for the 27th Voorburg Group meeting. However, only a limited number of countries produce product level information. There is no EU legal requirement to collect product level information for this sector. Table 1 below describes the extent to which annual data is available from the 22 countries who responded to the VG country progress survey.

Table 1 Availability of turnover information, 2012

ISIC 4	Industry	CPC Product level
3600 Water collection, treatment and supply	19	6

Source: Voorburg Group Country Reports, 2012. There were 22 respondent countries to this survey.

3.2 Collection of data

Annual turnover data are collected using one, or a combination, of the following approaches:

- detailed surveys or censuses which also collect information on other characteristics such as number of employees, cost of sales, other expenses, investment, stocks etc.
- administrative data such as value-added tax, corporation tax returns, information from environment related surveys

Detailed structural results are generally compiled after at least a year from the reporting period.

Short-term turnover indicators are usually compiled as follows:

- short sample surveys on total turnover/production in a month/quarter which may also collect summary information on other characteristics such as number of employees
- administrative data such as monthly VAT returns

Results are generally published as indices and their purpose is to provide a short-term indicator of economic performance in the sector as well as an input to the monthly/quarterly national accounts. Although this sector is not covered by the EU Short-term Statistics Regulation some member states such as Sweden, France and Poland cover this sector for national purposes.

Annual product level turnover data are collected by means of statistical survey. In France and Hungary the 'Annual Production survey' PRODCOM is used to collect the product level information. PRODCOM is an EU Regulation covering the collection of both the physical volume of production sold during the survey period as well as the value of production sold in that period. The coverage of the survey relates to the mining and quarrying and manufacturing sectors however some countries also extend the coverage to include Water supply, sewerage, waste management and remediation activities.

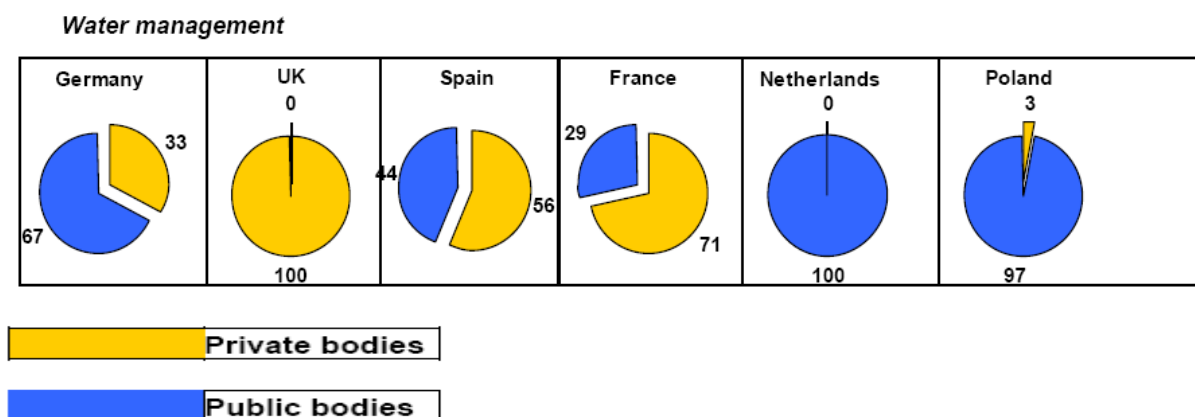
Alternative information sources such as the environmental accounts were referenced in the discussion at the Voorburg Group meeting. Measurement of output should benefit from the environmental accounting exercise even though differences exist between the needs of 'business statistics' and those of environmental accountants.

3.3 Data issues

Co-production between public and private bodies

The organization of the industry differs across countries with varying levels of public and private sector involvement. This poses a number of challenges for the measurement of the output of the sector and comparability across different countries. The chart below shows the extent of difference between public and private ownership in Europe.

Chart 1: Distribution of ownership of public and private bodies in Europe



Source: BIPE

In many countries, a significant share of *Water Collection, Treatment and Supply activities* is performed by local government or municipalities themselves rather than enterprises belonging to the business sector. Activity in this sector could therefore be classified under local government activity rather than the *Water Collection, Treatment and Supply* sector. This poses problems in comparing output of the sector across different countries where the pattern of ownership is different.

Secondary activity

The activities of the *Water Collection, Treatment and Supply sector* are often carried out in connection with or by units also engaged in the treatment of sewerage. In France, almost one third of the turnover of the sector was accounted for by the secondary activity of sewerage. Treatment of sewerage as a secondary activity of the *Water Collection, Treatment and Supply sector* was greater than industry turnover for the Sewerage sector ISIC 37. Other secondary activities may include construction, real estate, architectural and technical consultancy services. This highlights the importance of collecting product level information across the business and local government sector.

3.4 Recommended approaches

Table 2 below provides an overview of best, good and minimum development options recommended for countries either designing new or re-developing existing turnover programs.

Overall, the majority of countries appear to have programs falling into the *good* category, with largely survey-driven programs that collect industry level data at an annual frequency, but that also rely on administrative data to supplement their survey programs.

Table 2: Options for Developing Turnover Statistics

Category	Data Source	Level of Detail Collected	Frequency	Cost
Best	Survey/Census	Industry turnover <u>and</u> product turnover detail	Annual & Sub-annual collection	- Most expensive - Largest response burden
Good	Survey/Census and Administrative (tax data, industry association data etc.)	Industry detail <u>only</u>	Annual	- Expensive - High response burden - Reconciling administrative data variables with survey variables
Minimum	Administrative (tax data, industry association data etc.) Environment account statistics	Industry detail <u>only</u>	Annual	- Least expensive - Little or no respondent burden - Low burden, cost - Suitability for turnover measurement must be checked carefully

4.0 Service Producer Price Indices (SPPI)

Prices tend to be based on a combination of fixed charges (service) and usage fees (good). The fixed charge should cover the cost of investment and maintenance of water works, pumping stations etc. and administration while the variable charge is based on the amount of water consumed. The price of water generally includes charges for sewerage and waste work treatment.

4.1 Data availability

There is a relatively good availability of industry-level prices for the *Water Collection, Treatment and Supply* sector. Almost 60% of respondents to the Voorburg Group Country Reports, 2012 reported that they compiled industry-level prices. Only 18% of respondents reported that they compiled these prices at a product level as detailed as the CPC. Table 3 below summarises the availability of PPIs for the sector to the VG Country survey.

Table 3 Availability of Service Producer Price Index information, 2012

ISIC 4	Industry	CPC Product level
3600 Water collection, treatment and supply	13	4

Source: Voorburg Group Country Reports, 2012. There were 22 respondent countries to this survey.

4.2 Source of SPPI data

The organization structure of the sector has implications for the sourcing of data to compile PPIs for water activities. In countries where there is a public provision of these services, prices tend to be collected from local government or municipalities. The prices can be collected directly from the municipality or in some cases obtained indirectly from trade associations. In countries where there is significant private sector involvement more traditional PPI surveys of enterprises are undertaken.

The Consumer Price Index is also used to measure price development in the provision of water and related services to households. In France, local bills for water and sewerage services are used in compiling their PPI and CPI. The PPI and CPI are combined to produce a B2All index for the sectors at basic and purchase prices.

4.3 Target coverage

The type of supplier, the type of target customer, the source of the water, the type of service provided and the geographic region are all potentially important price determining characteristics.

Coverage of the price collection should take into account public and private sector provision of services.

Price collection in this sector can be targeted at business users (B2B) of the service or all users (B2ALL). The approach varies across countries who compile PPIs for the sector and reflects different market conditions. In Sweden for example the industrial sector is almost self-sufficient in terms of water supply so only households are included in the Swedish PPI.

Accessibility to water and source of the water also influence price. French data suggests that the provision of surface water is more expensive than ground water.

As the provision of sewerage and water services are closely linked, price coverage if possible should relate to the water aspect of the service.

In some countries, for example Hungary, water prices are determined centrally by the State. In other countries regional divergences exist and these should be taken into account in survey design.

4.4 Pricing methods used

Pricing mechanisms for water collection, treatment and supply are generally a combination of fixed charge for the service and a usage fee for the water provided. Other service charges such as sewerage may also be included in the observed price. As a result, the main pricing methods used are:

- direct use of repeated services
- unit value pricing

4.5 Weights

The type of weights required varies according to the approach taken in the PPI compilation.

The Voorburg Group Status report 2012 indicates that CPC product level turnover information is compiled for only 18% of the responding countries however it appears water plants can provide detailed information on the total production of water for households, industry, public authorities as well as losses in distribution. In Sweden municipal water plants can provide information on the consumption levels by category of house type.

4.6 Main issues in price measurement

Good or service

The economic classification suggests that water plants provide a ‘good’ in water distribution and mainly ‘services’ in sewerage. However, an alternative view is that water suppliers may treat polluted water and hence provide a service in supplying water of constant quality to consumers. The consumer of water assumes they are buying a homogeneous product, a volume of drinking water (a good). The provider of water services however, is inclined to think in terms of service provision. The provider does not consider it is providing a homogeneous product but rather heterogeneous services where varying quality water may be obtained from different sources.

As a result, from a producers perspective it would be desirable to quality adjust prices to reflect differing inputs. The French statistical institute, INSEE, has decided to disseminate their official PPI without quality adjustment. However, in order to meet user needs, they have also decided to make available a variant PPI index which has been quality adjusted.

Bundled products or services

The provision of sewerage services in tandem with the distribution of water can pose challenges in decoupling the two activities for the purposes of compiling PPIs at an industry level. Price and weight data may be difficult to obtain from the water authorities.

Involvement of public sector

Water services can be provided by public or private sectors or a mixture of both. This has implications for pricing as the non-market (government) provision of services is not in the scope of the SPPI. The share of the market held by private sector operators is important in this respect. In many cases the market sector may not be large enough to be used as a proxy for the industry as a whole. Also water prices, particularly for households may be heavily subsidized by central or local government.

Use of the consumer price index (CPI)

The CPI collects data on the price of water services charged to households. In some cases the CPI can be used as a proxy in the compilation of a SPPI for the sector. In France the CPI is used in the compilation of a B2All SPPI. In Sweden, the CPI is used as a proxy until real price data is transmitted from the municipal water plants. The industrial sector in Sweden is largely self-sufficient in the production of water so it is appropriate to use the CPI.

The CPI should however be adjusted to basic prices if it is being used in the compilation of a PPI. If prices to industry are different to those of households the CPI may not be a good proxy in the compilation of an SPPI.

Scale effect and decreasing quantities

The price of water consumed may be subject to a sliding scale based on volume consumed. This can lead to an apparent paradox whereby environmentally conscious water consumers pay more per cubic metre of water because they consume less.

4.7 Recommended approaches

Table 4 below provides an overview of best, good and minimum development options recommended for countries either designing new or re-developing existing SPPI programs.

Table 4: Options for Developing SPPI Statistics for Water Collection, Treatment & Supply

Category	Pricing method	Data type in the survey	Quality and Accuracy	Cost
Best	- PPI	Average price charged per cubic metre of water by type of consumer and service provided	Good data quality if the water plant has the price information by type of customer and service provided	Expensive burdensome method
		Direct price of repeat services	Good data quality if the service is sufficiently detailed and specification remains representative	Expensive burdensome method
Good	- Consumer price	Price incurred for water services	Data collected for CPI purposes. Hence taxes included. Poor quality if different pricing exists for business and household users	Least expensive method with no response burden (caused by the SPPI collection).
Minimum	- Average price of water distributed	Data is based on revenues divided by volume of water distributed	Product bundling and differences in weighting between business and household consumers will reduce quality. Subsidies may need to be taken into account	Cost effective as data may already exist in environment statistics

5.0 Summary of main conclusions

The different natural environments and market organizations of the *Water Collection, Treatment and Supply* sector across countries can lead to varying national practices. The organisation of the sector tends to be highly regulated and differs across countries with varying levels of public and private sector involvement.

International classifications are well harmonized but different levels of detail exist at the industry level. At a product level there are differences between the CPA which is based on the industry of origin, and other international classifications. The overall structure of the CPC and NAPCS are based on characteristics and use of the good or service rather than their industry of origin.

There is good availability of data on the output of this sector from traditional business surveys, administrative data and environmental statistics. A significant proportion of turnover from enterprises in this sector can be generated from secondary activities and in particular sewerage activities. As a result it is important to produce good product level turnover information. Also, in collecting this product level information it is necessary to look beyond the industry of origin and cater for secondary activities such as sewerage that is classified in different sectors.

In many countries, a significant share of *Water Collection, Treatment and Supply activities* is performed by local government or municipalities themselves rather than enterprises belonging to the business sector. Activity in this sector could therefore be classified under local government activity rather than the *Water Collection, Treatment and Supply* sector. This poses problems in comparing output of the sector across different countries where the pattern of ownership is different.

There is a relatively good availability of industry-level prices for the sector. Price data may be sourced from municipalities, trade associations, traditional PPI surveys of establishments providing the service or the Consumer Price Index. The type of supplier, the type of target customer, the source of the water, the type of service provided and the geographic region are all potentially important price determining characteristics. Pricing mechanisms for water collection, treatment and supply are generally a combination of fixed charge for the service and a usage fee for the water provided. Other service charges such as sewerage may also be included in the observed price. The main pricing methods used are direct use of repeated services or unit value pricing. Water services can be provided by public or private sectors or a mixture of both. This has implications for pricing as the non-market (government) provision of services is not in the scope of the SPPI. The share of the market held by private sector operators is important in this respect.

As is the case with many service sectors, a wide range of national practices are observed. The Voorburg Group cannot provide a single best course of action but provides examples and experiences from European countries for consideration and adaptation as appropriate.

Appendix 1 : Overview of industry classifications

ISIC 4	NACE Rev.2	NAICS 2012
E: Water supply, sewerage, waste management and remediation activities	E: Water supply, sewerage, waste management and remediation activities	22 Utilities
		221 Utilities
36 Water collection, treatment and supply	36 Water collection, treatment and supply	2213 Water, Sewage and Other Systems
360 Water collection, treatment and supply	360 Water collection, treatment and supply	22131 Water Supply and Irrigation Systems
3600 Water collection, treatment and supply	3600 Water collection, treatment and supply	221310 Water Supply and Irrigation Systems

Appendix 2

References

Classifications:

UN International Standard Industrial Classification Rev.4
<http://unstats.un.org/unsd/cr/registry/isic-4.asp>

NACE Revision 2 accessed at:
http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/publication?p_product_code=KS-RA-07-015

North American Industry Classification (NAICS) 2007 accessed at:
<http://www.census.gov/epcd/naics07/>

Central Product Classification (CPC) Version 2.0 accessed at:
<http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=25&Lg=1>

Classification of Products by Activity (CPA) 2008, Eurostat, accessed at:
http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_NOM_DTL&StrNom=CPA_2008&StrLanguageCode=EN&IntPcKey=&StrLayoutCode=HIERARCHIC&CFID=2378695&CFTOKEN=51e1cd3cb0fdab40-49728D92-E775-C825-8A2EB4CF4033739E&jsessionId=f90089d754e52f6c7549

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<http://www.census.gov/eos/www/napcs/index.html>

Mini-presentations:

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http://www.voorburggroup.org/Documents/2012%20Warsaw/Papers/4004%20-%20Water_Treatment_Rozanska.pdf

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http://www.voorburggroup.org/Documents/2012%20Warsaw/Papers/4009%20-%20Water_Treatment_PPI_Strand.pdf

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http://www.voorburggroup.org/Documents/2012%20Warsaw/Papers/4011%20-%20VG_Water_36_Hungary_2012_10_04.ppt

Other:

Session summary on Water Treatment and Distribution Services, Niall O’Hanlon, CSO Ireland
<http://www.voorburggroup.org/Documents/2012%20Warsaw/Papers/6002%20-%20Session%20summary%20-%20Water%20Treatment%20and%20Distribution%20Services.pdf>

