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Expenditures for the management of waste, wastewater and water resources in Italy

The new time series 1997-2009 of expenditure data on waste, wastewater and water resources management for Italy, calculated according to SERIEE[1] are now available at Istat web-site.
SERIEE accounts provide aggregates suitable for describing activities and related transactions aimed at protecting the natural environment against pollution and degradation phenomena as well as activities and transactions aimed at managing and saving the stock of natural resources against depletion phenomena. The calculations made according to SERIEE are consistent with fundamental SNA concepts and schemes and are aligned with the international guidelines provided by the SEEA for the development of an integrated environmental and economic accounting system[2].

The national expenditure aggregate, which describes the resources devoted by resident units to the preservation of the natural environment, is one of the main figures in the SERIEE accounting tables. Both final and intermediate consumption of environmental services are included in it, as well as the investments made for the production of the same services.
The national expenditure for waste, wastewater and water resources management services jointly considered amounted in Italy, in 2009, to 34.730 million euros (2.3 per cent of GDP); this figure is broken down by environmental domain as follows: 21.514 million euros for waste management (1.4 per cent of GDP), 9.516 million euros for water resources management (0.6 per cent of GDP) and 3.700 million euros for wastewater management (0.2 per cent of GDP).

Final[3] and intermediate consumption appear to be the main components of national expenditure in this group of environmental domains. The two components as a whole accounted for more than 80 per cent of national expenditure in all three domains in 2009, ranging from 84 per cent in the water resources case, to 91 per cent for waste. More in detail, in 2009, intermediate consumption was the main component of national expenditure for waste and wastewater management services (58 per cent and 59 per cent, respectively); final consumption was the main component in the case of water resources management services (53 per cent).

As far as investments are concerned, in 2009 they accounted for more than 11 per cent of national expenditure for waste, wastewater and water resources management services considered as a whole.
The investments made by specialised producers[4] have shown varied trends from 1997 to 2009, resulting in a decrease of public investments at the end of the period in all three domains and an increase of private investments mainly in the waste and water resources management domains. These trends highlight a privatization process in the production of the environmental services at issue, more clearly observed in the second half of the period.

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[1] *Système Européen de Rassemblement de l'Information Economique sur l'Environnemen.* See the relevant publications on the Eurostat web-site.
[2] See United Nations et alii (2003), *Integrated Environmental and Economic Accounting*, Handbook of National Accounting; http://unstats.un.org/unsd/envAccounting/seea.htm.
[3] Final consumption includes Households' consumption, General Government's (GG) consumption and Non-profit institutions serving households' (NPISHs) consumption. GG's consumption and NPISHs' consumption correspond to services they provide to the community as a whole, in particular through administration and regulation activities, or education, training and information activities.
[4] These are units that produce environmental services as their principal activity.

The investments of ancillary producers[5] have increased by 73 per cent from 1997 to 2009 in the waste and wastewater management domains jointly considered, highlighting an ongoing process of internalization in the production of these services[6].

[5] These are units that produce environmental services for their own uses.
[6] Data related to ancillary producers of water resources services are not available.

National expenditure for waste, wastewater and water resources management services, by components – Years 1997-2009
(million euros at current prices)

National expenditure by components	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
						Waste management							
Final consumption	3.817	4.186	4.110	4.160	4.269	4.483	4.687	5.381	5.664	5.894	6.315	6.878	7.097
Households	*3.788*	*4.154*	*4.069*	*4.122*	*4.221*	*4.432*	*4.634*	*5.322*	*5.609*	*5.833*	*6.223*	*6.658*	*6.818*
GG & NPISHs (*)	*29*	*32*	*42*	*38*	*48*	*52*	*53*	*59*	*55*	*61*	*92*	*220*	*279*
Intermediate consumption – *Corporations*	6.097	7.404	8.166	9.082	9.664	10.478	10.604	11.302	11.321	11.330	11.872	12.350	12.419
Investments	1.107	1.314	1.372	1.495	2.461	1.917	2.061	2.150	1.883	2.371	2.342	2.490	1.997
Specialised producers - GG & NPISHs (*)	*444*	*457*	*470*	*500*	*484*	*551*	*564*	*297*	*293*	*283*	*284*	*288*	*298*
Specialised producers - Corporations	*551*	*659*	*685*	*745*	*1.192*	*1.137*	*1.205*	*1.717*	*1.356*	*1.895*	*1.751*	*1.897*	*1.387*
Ancillary producers	*112*	*197*	*218*	*251*	*786*	*230*	*293*	*137*	*234*	*194*	*308*	*305*	*312*
National expenditure	**11.021**	**12.904**	**13.648**	**14.737**	**16.394**	**16.878**	**17.352**	**18.833**	**18.868**	**19.595**	**20.529**	**21.718**	**21.514**
						Wastewater management							
Final consumption	949	837	994	936	968	925	952	997	994	1.098	1.079	1.056	1.103
Households	*507*	*516*	*609*	*617*	*625*	*637*	*637*	*692*	*695*	*761*	*723*	*737*	*760*
GG & NPISHs (*)	*442*	*322*	*385*	*319*	*344*	*288*	*315*	*305*	*299*	*337*	*356*	*319*	*343*
Intermediate consumption – *Corporations*	1.116	1.291	1.435	1.431	1.462	1.535	1.543	1.683	1.819	1.892	1.942	2.110	2.187
Investments	505	564	606	717	1.140	645	706	530	689	582	617	458	410
Specialised producers - GG & NPISHs (*)	*134*	*119*	*144*	*131*	*121*	*112*	*111*	*68*	*65*	*66*	*66*	*52*	*53*
Specialised producers - Corporations	*166*	*182*	*172*	*254*	*204*	*226*	*164*	*240*	*207*	*163*	*212*	*149*	*123*
Ancillary producers	*204*	*264*	*290*	*331*	*816*	*306*	*431*	*221*	*417*	*353*	*338*	*257*	*234*
National expenditure	**2.570**	**2.693**	**3.036**	**3.083**	**3.570**	**3.105**	**3.201**	**3.209**	**3.502**	**3.571**	**3.638**	**3.624**	**3.700**
						Water resources management							
Final consumption	2.800	3.075	3.271	3.446	3.615	3.856	4.236	4.509	4.602	4.651	4.826	4.910	5.050
Households	*2.602*	*2.873*	*3.084*	*3.237*	*3.411*	*3.638*	*3.999*	*4.232*	*4.357*	*4.404*	*4.580*	*4.624*	*4.763*
GG & NPISHs (*)	*198*	*203*	*187*	*209*	*204*	*218*	*237*	*277*	*245*	*248*	*246*	*286*	*287*
Intermediate consumption – *Corporations*	2.062	2.221	2.352	2.305	2.277	2.301	2.525	2.677	2.683	2.701	2.807	2.843	2.905
Investments	1.392	1.178	1.415	1.600	1.776	1.847	2.168	1.731	1.579	1.731	1.694	1.744	1.561
Specialised producers - GG & NPISHs (*)	*449*	*625*	*806*	*843*	*873*	*979*	*1.012*	*537*	*450*	*438*	*364*	*329*	*331*
Specialised producers - Corporations	*944*	*553*	*609*	*757*	*903*	*868*	*1.156*	*1.194*	*1.129*	*1.293*	*1.330*	*1.415*	*1.230*
Ancillary producers	*….*	*….*	*….*	*….*	*….*	*….*	*….*	*….*	*….*	*….*	*….*	*….*	*….*
National expenditure	**6.254**	**6.475**	**7.038**	**7.350**	**7.669**	**8.004**	**8.929**	**8.918**	**8.863**	**9.084**	**9.327**	**9.497**	**9.516**
						Total							
Final consumption	7.566	8.099	8.376	8.541	8.852	9.264	9.875	10.887	11.259	11.643	12.220	12.844	13.251
Households	*6.897*	*7.543*	*7.762*	*7.976*	*8.256*	*8.707*	*9.271*	*10.247*	*10.660*	*10.997*	*11.526*	*12.019*	*12.342*
GG & NPISHs (*)	*670*	*556*	*614*	*565*	*596*	*558*	*605*	*640*	*599*	*645*	*694*	*825*	*909*
Intermediate consumption – *Corporations*	9.275	10.916	11.953	12.817	13.403	14.313	14.671	15.662	15.823	15.923	16.620	17.302	17.511
Investments	3.004	3.056	3.394	3.812	5.378	4.409	4.936	4.411	4.151	4.685	4.654	4.693	3.968
Specialised producers - GG & NPISHs (*)	*1.027*	*1.201*	*1.419*	*1.474*	*1.477*	*1.642*	*1.686*	*903*	*807*	*787*	*714*	*669*	*683*
Specialised producers - Corporations	*1.660*	*1.394*	*1.465*	*1.756*	*2.299*	*2.231*	*2.525*	*3.151*	*2.693*	*3.350*	*3.293*	*3.461*	*2.739*
Ancillary producers	*317*	*461*	*509*	*582*	*1.601*	*536*	*724*	*357*	*651*	*547*	*646*	*562*	*546*
National expenditure	**19.846**	**22.072**	**23.723**	**25.171**	**27.633**	**27.986**	**29.482**	**30.960**	**31.233**	**32.250**	**33.494**	**34.839**	**34.730**

(*)General Government and Non-profit institutions serving households

Symbol: "…." = the transaction exists but no data are available.

For more detailed information please refer to the Italian version

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Note

1. SERIEE satellite accounts

Environmental expenditure satellite accounts according to SERIEE describe expenditures and economic activities carried out by resident units of the national economy for environmental protection and management of natural resources.
Within a system of integrated environmental and economic accounting, SERIEE accounts provide aggregates which describe "responses" of the socio-economic system to environmental pollution, degradation phenomena and depletion of natural resources. In particular, the overall aggregate "national expenditure" - including consumption of environmental services and investments for their production - is an assessment of the total economic effort devoted by a country to environmental protection and management of natural resources.
Data from SERIEE monetary accounts, integrated with data in physical units such as e.g. on environmental pressures or state of the environment, may also be used for analyses of efficiency and effectiveness of environmental policies or for analysis of the degree of application of the "polluter pays principle", etc.

The SERIEE system comprises two satellite accounts:

- the Environmental Protection Expenditure Account (EPEA), aiming at the description of measures and related expenditures carried out to protect the environment against pollution (air emissions, wastewater, waste, soil pollution,…) and degradation phenomena (loss of biodiversity, soil erosion, salinization, ...);
- the Natural Resource Use and Management Expenditure Account (RUMEA), devoted to the description of measures and related expenditures carried out to use and manage natural resources (water resources, fossil energy, forest resources, wild flora and fauna,..) and to save the stock of these resources against depletion phenomena .

2. Classification of environmental activities and expenditures

Activities and expenditures related to "environmental protection" – accounted for in the EPEA module – are classified according to CEPA 2000 (*Classification of Environmental Protection Activities and expenditure*). This classification has been endorsed by the United Nations, the OECD, the European Union, the International Monetary Fund, and the World Bank. The same classification has also been adopted by COFOG (*Classification Of Functions of Government*), which concerns all General Government functions.
As far as activities and expenditures related to "use and management of natural resources" are concerned – accounted for in the RUMEA module –, CRUMA (*Classification of Resource Use and Management Activities and expenditure*) is now in the process of being adopted as an international standard.
Following the revised European Strategy for Environmental Accounting (ESEA), the development of RUMEA accounts - both in terms of methodology and implementation – and the adoption of CRUMA are given the highest priority in the international agenda, beyond Europe. Istat is actively involved in this process. In particular, within the London Group on environmental accounting Istat put forward a proposal with an Italian version of CRUMA, developed since 2006, characterised by being consistent with the SERIEE framework and the structure and classification principles of CEPA.
Table 1 presents both CEPA 2000 and CRUMA as developed and actually adopted by Istat, both broken down by classes corresponding to the first digit of each classification.

Table 1 – Classification of environmental activities and expenditures of SERIEE accounts

Classification	Class[1]	
ENVIRONMENTAL PROTECTION (EPEA)		
CEPA 2000	1	Protection of ambient air and climate
	2	**Wastewater management**
	3	**Waste management**
	4	Protection and remediation of soil, groundwater and surface water
	5	Noise and vibration abatement (excluding workplace protection)
	6	Protection of biodiversity and landscapes
	7	Protection against radiation (excluding external safety)
	8	Research and development for environmental protection
	9	Other environmental protection activities for environmental protection [2]
USE AND MANAGEMENT OF NATURAL RESOURCES (RUMEA)		
CRUMA (provisional)	**10**	**Use and management of water resources**
	11	Use and management of natural forest resources
	12	Use and management of wild flora and fauna
	13	Use and management of fossil energy
	14	Use and management of raw materials
	15	Research and development activities for natural resource use and management
	16	Other natural resource use and management activities [3]

[1] Classes in bold are those for which data are currently being released by Istat.

[2] This class includes general administration and management activities, education training and information, activities leading to indivisible expenditure, activities not elsewhere classified related to environmental protection.

[3] This class includes general administration and management activities, education training and information, activities leading to indivisible expenditure, activities not elsewhere classified related to use and management of natural resources.

3. SERIEE accounting tables

Environmental expenditures are represented in the SERIEE system through a set of five interrelated accounting tables, which describe, for each reference year and environmental sector of CEPA and/or CRUMA classifications: the supply of environmental services and the way they are produced; the uses of environmental services broken down by categories of users; the specific transfers – unrequited payments – that lead to a redistribution of the financial burden related to environmental expenditures among the different institutional sectors.

SERIEE accounting tables for Cepa 2 (waste management), Cepa 3 (wastewater management) and Cruma 10 (use and management of water resources) are available on the Istat web-site. Table 2 below provides useful information about the structure and the main aggregates related to SERIEE accounting tables.

In addition to the above mentioned accounting tables, Istat produces a supply and use table which summarises and compares the resources and uses of waste, wastewater and water resources management services. In particular, the columns show the environmental services; the rows show, in the upper part, the resources at basic prices (production by kind of producers and imports) and its value at purchasers' prices, and, in the lower part, the uses at purchasers' prices by kind of uses (intermediate consumption, final consumption and exports). The value of the uses includes, consistently with the aggregate of the national expenditure, possible specific transfers - accounted for as implicit subsidies – which lower the purchasers' price paid by users of environmental services. When such transfers occur, the value of the uses becomes higher than the value of the resources. As a consequence in the last row of the Table a

balancing item – implicit subsidies – is included: total supply at purchasers' prices can be obtained by subtracting the implicit subsidies from total uses at purchasers' prices.

Table 2 – SERIEE accounting tables

Accounting table	Notes
Table B	Describes the domestic production of environmental services. Columns show the main categories of producers: specialised producers (broken down into GG&NPISHs and corporations); secondary producers; ancillary producers. Rows show the economic transactions related to environmental services' production: inputs to production (cost structure); gross fixed capital formation; sales (or turnover). The main aggregate accounted for in Table B is the "environmental output" broken down by category of producers and by type of output, that is "non-market" output (i.e. the product is sold at a price covering less than 50 per cent of production costs), "market" output (i.e. the product is sold at a price covering at least 50 per cent of production costs), ancillary output (i.e. production for own use). This aggregate is valued at basic prices.
Table B1	Describes how the supply of characteristic environmental services, accounted for in Table B, is allocated to the main use categories: final consumption, intermediate consumption, capital formation. Column headings of Table B1 match the different types of production of Table B: non market, market, ancillary. Rows show uses by type of use and resources by kind of producers. Since uses of environmental services are recorded at purchasers' prices, whereas the supply of these services is valued at basic prices, on the supply-side, the item 'net taxes on products (non-deductible VAT and other taxes on products minus deducting subsidies on products) is added to obtain the supply at purchasers' prices. As the national expenditure describes the uses of economic resources by the domestic economy, imports and exports have to be included among the aggregates related to supply and uses respectively.
Table A	Describes the "national expenditure" for environmental services by kind of uses (rows) and by kind of users of environmental services or beneficiaries of specific transfers (columns). The main components of national expenditure (kind of uses) consist in: - final and intermediate consumption; - gross capital formation (land improvement)[7], - gross fixed capital formation (investments for the production of environmental services); - specific transfers which are not a counterpart of the above mentioned aggregates.
Table C	Describes the financing of national expenditure accounted for in Table A. The units which consume environmental services or invest in environmental protection or use and management of natural resources are not necessarily the financing units – i.e. the units actually bearing the expenditure - because they may benefit from specific transfers. Table C is devoted to the presentation of financing by simply cross-tabulating the user/beneficiary units and the financing units. Column headings of Table C, the same as the headings of Table A, show the users of environmental services or beneficiaries of specific transfers. Rows of the table distribute the financing units according to the institutional sectors of the national accounts.
Table C1	Describes the "net-cost" born by the different categories of resident units due to environmental protection and use and management of natural resources. The aggregate is calculated starting from current national expenditure, and by adding other costs item (i.e. computed interest on fixed assets representing the opportunity cost of the use of these assets for environmental activities rather other production activities) and deducting economic benefits related to production of environmental services (e.g.: profits for corporations, receipts from taxes for General Government) Columns show the different institutional sector. Rows show the different items that contribute to financial burden calculation.

4. Environmental services' producers

In the SERIEE accounting tables the supply and use of environmental services is broken down by institutional sectors (General Government; Non-profit institutions serving households; Corporations; Households); the supply of environmental services is also presented by kind of producers: specialised, secondary and ancillary producers.

As far as the supply of environmental services is concerned, it should be noted that there isn't a one-to-one correspondence between environmental services production activities and some specific activities of ATECO 2002 (the national version of European nomenclature NACE Rev. 1.1); hence the production of environmental services can't be calculated by grouping statistical information related to specific economic activities of ATECO 2002. Table 3 provides a list of ATECO 2002 economic activities which

[7] The only example of purchase of environmental services to be regarded as gross capital formation is the purchase of soil remediation activities as these activities result in an improved quality of the soil and, consequently, of its value. Hence, in the data released there is no example of gross capital formation as soil remediation activities are not included.

included the producers of waster, wastewater and water resources management services, broken down by specialised, secondary and ancillary producers.

Specialised producers include those institutional units which produce environmental services as their principal activity, which is the main source of value added. Specialised producers belong to private corporations as well as to general government and non-profit institutions serving households; general government offices responsible for administration and regulation activities of environmental services are included.

Secondary producers include those institutional units which produce environmental services in addition to the principal activity. In the context of the satellite accounts released here, secondary producers belong mainly to private corporations.

Ancillary producers include those institutional units which produce environmental services for their own uses in order to manage their own environmental pressures (waste, wastewater, etc….), sometimes replacing the same service provided by private or public units. Ancillary producers are private corporations that may belong to almost all economic sectors.

Table 3 – "ATECO 2002" codes which include environmental services, by kind of producer and by environmental service

Kind of producer	Environmental service		
	Waste management	**Wastewater management**	**Water resources management**
Specialised producers	75.12.3 – Regulation of the activities of agencies that provide management of projects related to housing, land use and environmental protection 90.02.0 – Collection and treatment of solid waste 90.03.0 – Sanitation, remediation and similar activities	75.12.3 – Regulation of the activities of agencies that provide management of projects related to housing, land use and environmental protection 90.01.0 – Collection and treatment of sewage 90.03.0 – Sanitation, remediation and similar activities	41.00.1 – Collection, purification and distribution of drinkable water 41.00.2 – Collection, purification and distribution of undrinkable water 75.12.3 – Regulation of the activities of agencies that provide management of projects related to housing, land use and environmental protection
Secondary producers	25.12 – Retreading and rebuilding of rubber tyres 35.11 – Building and repairing of ships 37 – Recycling 45.11 – Demolition and wrecking of buildings; earth moving 45.25 – Other construction work involving special trades 51.57 – Wholesale of waste and scrap 74.70 – Industrial cleaning	45.21 – General construction of buildings and civil engineering works	01.41.2 – Agricultural service activities related to harvesting, primary processing, storage of agricultural products and other agriculture-related services on a fee 90.01.0 – Collection and treatment of sewage
Ancillary producers	C – Mining and quarrying D – Manufacturing (not included division 37 – Recycling) E – Electricity, gas and water supply F – Construction G – Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods H – Hotels and restaurants I – Transport, storage and communication J – Financial intermediation K – Real estate, renting and business activities M – Education N – Health and social work O – Other community, social and personal service activities (not included division 90 - Sewage and refuse disposal, sanitation and similar activities and division 91 - Activities of membership organizations n.e.c)		