







UTILITALIA FEDERAZIONE UTILITIES acqua - ambiente - energia

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KEY MESSAGES

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The European legal and regulatory frameworks for waste are constantly evolving. Over the past year, **several legislative paths** have been developed to establish or revise important regulations concerning packaging and packaging waste, batteries and battery waste, and exports of waste to other states. Similarly, in our country, the evolution of the regulatory framework has led to the definition of the *Italian National Strategy for the Circular Economy*, the *Italian National Waste Management Programme* and the *Minimum Environmental Criteria* for the assignment of municipal waste collection services. Other important milestones were the acceleration of legislation on the **development of biomethane** and the **routine maintenance** of technical regulations on waste management.

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The overcoming of the pandemic and economic crisis has led to an **increase in the production of municipal waste in Italy,** which, in **2021**, reached **502 kg per inhabitant**, with a variation of **+3% compared to 2020**. However, growth is lower than socio-economic indicators such as GDP (+6.7%) and household consumption (+5.3%). **Separate waste collection is also growing, reaching 64% of national production in 2021**, while the amount per capita is 272 kg. The analysis of the data highlights the need to **accelerate the improvement of the urban waste management system**, especially in the Central South, with a view to achieving EU targets. The **percentage of preparation for re-use and recycling is stuck at around 48% as of 2019**, while **landfill disposal** still accounts for **19%** of municipal waste in 2021. It is necessary to improve the quality of separate collection and to invest in new facilities.



The **process of implementing local governance models** required by the legislation in several regions is **still incomplete**. On the management front, mainly in the Central South, the sector is characterised by **strong fragmentation both horizontally**, due to the large number of operators active in municipal territories, **and vertically** within the integrated cycle. At the national level, the type of **management** assignment is **mainly public (40%)**, while **in the South private operators are predominant (48%)**.



In 2021, the sector's turnover (based on a sample of 534 companies) reached approximately EUR 13.5 billion, equivalent to about 0.8% of the national GDP, employing more than 97,000 direct employees, which makes up 0.4% of the total number of employees in Italy and about 1.7% of the industrial sector's employment. Facility management companies are the ones that achieve the best economic performance, as also confirmed by the data on added value per employee (EUR 150,000 per employee), while collection management or integrated cycle companies record a lower level of productivity (EUR 80,000 and EUR 109,000 per employee, respectively). Similarly, companies with higher turnover (> EUR 100 million) achieve the best economic and financial performance.

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The analysis of tenders for the awarding of services (published in the period 2014–2022) confirms the **difficulties and delays in standardising the size and timing of the awarding of urban waste management services** at the national level. Today, the majority of tenders (**87%** of 2,499 analysed) are issued **to award the service to a single municipality**, and **85% of tenders awarded for** waste management services have a **duration of 5 years or less. Most of the tenders (67%) are located in southern Italy**, a situation linked to the reduced presence of public companies in this part of the country.

Southern Italy continues to have a significant facility deficit that does not allow for the proper completion of the waste cycle and contributes to the expenditure differential for the urban waste management service. Due to the higher cost incurred for the transport of waste to facilities outside the Region, in fact, **the South registers the highest TARI (waste tax) in the country**, with **368 euros in 2022**, leaving behind the Centre (335 euros) and the North (276 euros). With 60% earmarked for southern regions, **the PNRR (National Recovery and Resilience Plan) could offer a boost to bridge the service divide in the country**.

With **2.1 billion euros** of resources allocated, the **PNRR** has given a great boost to investments in the environmental sector, especially in southern Italy. The response from companies has been significant, with a **volume of candidate projects** amounting to approximately **7 billion euros**. The estimated **requirement for the sector by 2035** is **approximately 6–7 billion euros (or 0.5–0.6 billion euros per year**).

The pandemic and geopolitical crises have emphasised the vulnerability of strategic raw material supply chains, which are crucial for the energy and ecological transition. The **sustainable raw material supply plan** must include a solution that integrates primary extraction with the **recycling of raw materials**. From this point of view, the **proper recycling of WEEE** (about 360,000 tonnes collected in 2021) represents an opportunity to reduce dependence on non-EU countries. In order to achieve this goal, it is necessary to **implement the infrastructure**, adapt the regulations for the collection of technological products and **streamline the authorisation procedures** for the construction of facilities.

The **organic fraction** constitutes about **40% of the municipal waste produced**, and its proper management is necessary to achieve EU targets and to protect the environment. In recent years, there has been an increase in the quantities treated in all areas of the country, with integrated anaerobic/ aerobic treatment and composting as the predominant treatment types. At the national level, a total of about **1.3 million tonnes are treated in facilities in regions other than those of production,** and this quantity represents about 18% of the organic waste from separate collection. The estimate of facility needs by 2035, with the achievement of circular economy objectives, for the treatment of this fraction highlights **the self-sufficiency of some parts of the country** (e.g. Sardinia and the North), while the **Centre, the southern peninsular and Sicily** are still expected to have a **significant deficit**.

The mandatory **separate collection of textile waste** will lead to an increase in this fraction, partly from the *fast fashion* industry, which will have to be properly managed. To date, **72% of Italian municipalities** collect textiles separately for a total collected quantity of about **154,000 tonnes (data for 2021)**. Investments in **new sorting and recycling technologies** are needed to ensure that circularity targets are met. The introduction of an **EPR model** in this supply chain could help generate environmental, social and economic benefits on a European scale, with savings **of 4.0 to 4.3 million tonnes of CO₂ emissions**, the creation of more than **15,000 new jobs** and a turnover of between **1.5 and 2.2 billion euros**.

EXECUTIVE SUMMARY

NEW STRATEGIES AND ACTIONS FOR THE EUROPEAN CIRCULAR ECONOMY The EU policy, legislative and regulatory framework on waste is evolving rapidly. The last year was mainly characterised by work on construction site regulations. That is, the legislative paths have been set in motion for the definition or revision of many important regulations that will govern waste management and the development of the sector in the coming years. These include the *National Strategy for the Circular Economy, which includes strategies for seven key supply chains: plastics, textiles, electronic waste, food and water, packaging, batteries and vehicles, and the construction industry.* In some of these areas, the Commission has recently intervened through the development of strategies or actual legislative proposals, some of which are summarised in Figure 1.

FIGURE 1

SUMMARY OF STRATEGIES AND MEASURES ENVISAGED BY THE EUROPEAN COMMISSION ON CERTAIN WASTE STREAMS.

EU STRATEGY ON SUSTAINABLE AND CIRCULAR TEXTILE PRODUCTS



OBJECTIVE: to improve the sustainability of the textile product production chain and the management of their waste

MEASURES: introduce design specifications to increase the degree of durability, reusability, repairability, recyclability, recycled material content, and counteract the release of microplastics. Combat overproduction of poor-quality textiles and reduce their disposal in landfills. The extension of Extended Producer Responsibility (EPR) systemsto this supply chain is one of the key innovations.

PROPOSAL FOR A EUROPEAN REGULATION ON PACKAGING AND PACKAGING WASTE



OBJECTIVE: to prevent waste generation, promote high-quality recycling and develop a market for secondary raw materials.

MEASURES: developing the re-use of packaging, introducing recyclability requirements, minimum design-for-recycling requirements and minimum post-consumer recycled content.

EU POLICY FRAMEWORK ON BIOBASED, BIODEGRADABLE AND COMPOSTABLE PLASTICS



OBJECTIVE: to improve the degree of knowledge of biobased plastics and guide future European policies in this regard.

MEASURES: the document clarifies the difference between biobased, biodegradable and compostable plastics. It clarifies the conditions under which these materials contribute to the reduction of CO2 emissions, and suggests greater transparency on the part of manufacturers by providing that the advertisements declare the exact percentage of biobased material contained in the products and the measurement methodology.

NEW EUROPEAN REGULATION ON BATTERIES



OBJECTIVE: to improve the sustainability of the entire battery life cycle

MEASURES: adoption of a policy of responsibility in the supply of raw materials, carbon footprint statement covering the entire production process and transparency of product information. Separate collection targets for batteries. Free collection from end users.Requirements concerning the minimum level of use of materials obtained from waste recovery in the production of new batteries.

Source: Utilitatis calculation based on data from the European Commission

At the European level, the revision of the regulation on cross-border exports of waste is also under discussion. In November 2021, the Commission presented its proposal with the basic aim of limiting the pollution produced by the management of its own waste in non-EU countries and, at the same time, taking advantage of the opportunity to manage much of the exported waste internally.

To this end, the Commission proposal provides for restrictions on exports to non-OECD countries, independent *audits* of exporting companies with their trading partners, and binding criteria for distinguishing between waste and used goods.

In order to develop the European waste management market, the Commission's proposals concern digitisation tools for shipments, harmonisation at the European level of waste classification, a ban on the export of plastic and hazardous waste to non-OECD countries, the phasing out of all exports over the next four years and a ban on the shipment of all waste for disposal to non-EU countries.

MEASURES FOR THE EXPORT OF WASTE TO NON-EU COUNTRIES

DIGITISATION AND MANAGEMENT HARMONISATION FOR THE CIRCULAR ECONOMY

POSSIBLE INCLUSION OF WASTE INCINERA-TION IN THE ETS

THE NATIONAL STRATEGY FOR THE CIRCULAR ECONOMY

THE NATIONAL PROGRAM OF WASTE MANAGEMENT

NEW MINIMUM ENVIRONMENTAL REQUIREMENTS FOR URBAN WASTE MANAGEMENT SERVICES

BIOMETHANE AND THE SALVAMARE LAW AMONG OTHER INNOVATIONS Besides recycling and exports, the new developments also concern incineration. The agreement recently reached by the European institutions (legislative resolution of the European Parliament of 18 April) concerning the *Emission Trading System* (ETS) provides for the inclusion of energy recovery from municipal waste in the ETS, a measure that also provides for the monitoring of climate-altering gas emissions from fossil fuels of facilities from 2024 onwards, and a verification by 31 July 2026 of the effects of this inclusion by means of a binding impact assessment to be drawn up by the European Commission. While the agreement has been applauded by environmental and other organisations, it has generated strong opposition from business associations, which complain about the possible double taxation that would have a direct effect on the service tariffs charged to citizens, the absence of responsibility for the generation of emissions (which would lie upstream in the supply chain), and the absence of an in-depth analysis of the real environmental impact of waste management (including landfills and other types of facilities).

Also important is the Commission's commitment to the development of the biomethane sector, which is strategic for energy independence, for which (in the context of RePowerEU) it has proposed to increase production to 35 billion cubic metres by 2030, estimating that investments in the order of EUR 37 billion are necessary for this purpose.

Regulatory developments at the national level are structured along three main lines. The first was characterised by the definition of strategic documents for the sector such as the *National Strategy for the Circular Economy* (SEC/Strategia nazionale per l'economia circola-re)¹, the *National Waste Management Programme* (PNGR/Programma nazionale di gestione dei rifiuti) and the *Minimum Environmental Criteria* (CAM/Criteri ambientali minimi) for the contracting of municipal waste collection services.

The National Strategy for the Circular Economy was adopted as part of Italy's National Plan for Recovery and Resilience (PNRR), and encompasses various topics including the creation of a market for secondary raw materials, the strengthening of the principle of Extended Producer Responsibility (EPR), the development of taxation favourable to the transition to the circular economy, the consolidation of actions targeting upstream circularity, the development of product lifecycle assessment methods and models, improved traceability of waste, and raising awareness of environmental education, with the creation of specific skills in the public and private sector.

The PNGR represents one of the structural reforms of the PNRR, and is a strategic guiding tool for regions and autonomous provinces in waste management planning. The Programme, which will be active over a six-year time window (2022–2028), sets the macro-objectives and defines the criteria and strategic lines to be followed by the Regions and Autonomous Provinces in drawing up and updating the Regional Waste Management Plans.

A further new measure is the entry into force of the new CAM for municipal waste management services. The CAMs introduce a set of requirements (contract clauses and award criteria) of an environmental nature that contracting authorities will have to use when awarding services. The objectives set out in the new legislation include: preventing the generation of waste, maximising the quantity and quality of separate collection, promoting the demand for recyclable goods and goods containing recycled materials, and encouraging technological innovation in the means of collection and transport of waste. In this way, CAMs, in addition to reducing the environmental externalities of the service, promote innovation and competitiveness of companies investing in the waste management sector.

In the field of biomethane, the news concerns the extension by one year of the effectiveness of the old incentive decree (2018) and the publication of the new decree, with the introduction of a different incentive system and, consequently, the publication by the GSE of new application procedures.

Other provisions relevant to the waste sector include the so-called Salva Mare (Save the Sea) Law, which contains some provisions on the management of waste recovered at sea and in inland waters, and the SNPA² Guidelines on the classification of waste.

 ¹ Decree of the Ministry of Ecological Transition, 24 June 2022, no. 259
² National Environmental Protection System

IN 2021, THE PER CAPITA PRODUCTION OF MUNICIPAL WASTE INCREASES: 502 KG/INHABITANT Municipal waste data confirm how the resumption of commuting and the return of tourism to our country after the crisis triggered by the COVID-19 pandemic have generated a recovery in production in 2021. The production of municipal waste increases in all geographical macro-areas (Fig. 2): in 2021, each Italian citizen produced an average of 502 kilograms of waste, an increase of +3% compared to 2020. However, this growth was lower than the so-cio-economic indicators, such as GDP and final consumption expenditure on the economic territory of resident and non-resident households, which grew by 6.7% and 5.3%, respectively.

FIGURE 2

PRODUCTION OF WASTE PER CAPITA BY GEOGRAPHICAL MACRO AREA (KG/(INHABITAN-T*YEAR)) – YEARS 2017–2021.



In 2021, the percentage of separate collection of municipal waste stood at 64% of the national output, an increase of one percentage point compared to 2020 (Fig. 3), after a decrease in 2020 (-0.9%).

FIGURE 3

TREND OF THE PERCENTAGE OF SEPARATE COLLECTION OF MUNICIPAL WASTE, YEARS 2017–2021



SEPERATE COLLECTION STANDS AT 64%

THE MOST COLLECTED SEPARATE WASTE FRACTION IS THE OR-GANIC FRACTION (39% OF SEPERATE COLLECTION) Among the sorted waste (Fig. 4), organic waste remains the most collected fraction, accounting for 39% of the total, (7.4 million tonnes, an increase of 3% compared to 2020). This is followed by paper and cardboard with 19.1% of the total and a collected waste quantity of more than 3.6 million tonnes, an increase of 3.3% compared to 2020. Then glass (11.9 per cent), with almost 2.3 million tonnes, also increasing compared to 2020 (+1.2 per cent). Plastic, which accounts for 8.8%, continues to show growth in the quantities collected separately (+6.4%), with a total amount collected nationwide of almost 1.7 million tonnes. Packaging accounts for 95% of the plastic waste collected separately.

FIGURE 4

PERCENTAGE BREAKDOWN OF SEPARATE COLLECTION, YEAR 2021



Source: ISPRA

Data on the management of Italian municipal waste in 2021 (Fig. 5) show that material recovery for the treatment of separated waste collection is the main destination: 50 per cent of the waste produced is sent here. Of these, 23% are sent to facilities recovering the organic fraction from separate collection (wet + green) and 27% to facilities recovering the other product fractions from separate collection. 18% of the municipal waste produced is incinerated, while landfilling still accounts for 19%. 5%, consisting of waste from the MBT facilities, is sent for further treatment such as refining to produce CSS or biostabilisation, while 2% is exported (about 659,000 tonnes). 3% is equally divided between waste sent to production facilities, such as cement factories, thermal power plants, etc., to landfills, for plant cover, and to domestic composting.

FIGURE 5

PERCENTAGE DISTRIBUTION OF URBAN WASTE MANAGEMENT, YEAR 2021



50% OF THE WASTE GOES TO MATERIAL RECOVERY. THE QUANTITY DESTINED FOR LANDFILL IS STILL HIGH (19%)

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RECYCLING LEVELS IN ITALY ARE AT 48.1% IN 2021. THE DATA FOR RE-CENT YEARS IS STABLE In 2021, the percentage of preparation for re-use and recycling stood at 48.1% (Fig. 6). Overall, substantial stability of recycling rates is observed compared to 2020, when a value of 48.4% was recorded, confirming a progressive widening in recent years of the gap between the percentage of separate collection and recycling rates, proving that collection, while constituting a step of primary importance to ensure the achievement of homogeneous flows, cannot represent the only element to achieve high recycling levels. In fact, it is necessary to ensure that the quantities collected are also characterised by a high level of quality, in order to enable them to be effectively recycled. The development of collections must also necessarily be accompanied by the availability of an adequate facility management system.

FIGURE 6



The facility system must be accompanied by an appropriate governance and operational approach. The overcoming of management fragmentation is of fundamental importance to achieve the objectives of cost efficiency and service effectiveness.

It should be noted that in the regions of Lazio and Calabria, the enactment of new regional laws has changed the existing governance structure. In Lazio, Regional Law 14/2022 divided the regional territory into 6 Optimal Territorial Areas (ATO, Ambiti Territoriali), while in Calabria, with Regional Law 10/2022, an ATO corresponding to the entire regional territory was identified.

In several cases, in addition to the perimeter per ATO, the regions have provided sub-areas for the awarding of services. Frequently, in fact, the delimitation into areas for the planning and organisation of the service does not coincide with the basins of management awarding. This results in a multi-level structure that sees the regional territory divided into assignment areas, sub-areas or basins that can also vary depending on the segment of the supply chain (Fig. 7).

In some cases, this network structure is transitional in nature, aimed at gradually guiding territories in the transition from strictly local service management to area-wide management. It is also noted that regions with large urban centres, characterised by large areas, high population density and high tourist and commuter flows, have planned basins coinciding with a single municipality.

OVERCOME MANAGEMENT FRAGMENTATION TO HARMONISATION FOR IMPROVE SERVICE EFFICIENCY

SUBDIVISION OF THE NATIONAL TERRITORY INTO ATO AND SUB-ATO



Source: Utilitatis calculations on the local authority register.

The implementation of existing legislation, reflected in different governance models, sometimes also depending on the different stages of the service, the simultaneous presence of derogations and the absence, or inoperability, of Area Government Agencies (EGAs/Enti di governo dell'ambito) in some areas of the country, provide a clear picture of heterogeneous local governance. Although several governing bodies have become operational in the last period, where regions have opted for local governance, the implementation process still remains incomplete in many regions, and the organisation of the service by optimal ATO regional areas is only achieved in a few regions. To date, in 13 regions EGAs are operational in all the planned ATOs, while in the remaining areas, situations of partial operation or total inoperability are observed (Fig. 8). Where EGAs are not operational, the municipalities represent the regionally competent bodies. As an additional element, it is underlined that Lombardy, in compliance with Article 200 of Legislative Decree No. 152 of 3 April 2006, is the only region that has opted for "*alternative or derogation models to the model of Ambiti Territoriali Ottimali*", and for this reason, it records a natural fragmentation of managers.

On the management front, as is well known, the sector is characterised by a high degree of horizontal dispersion, due to the high number of operators active in regions that are often municipal in size, and vertical dispersion, with the presence of numerous operators specialising in the upstream or downstream stages of the chain and few large operators capable of completing the cycle.

FIGURE 8

FIGURE 7

LEVEL OF OPERATION OF THE AREA GOVERNMENT AGENCIES



Source: Utilitatis calculations on the local authority register.

THE LOCAL GOVERNANCE IMPLEMENTATION PROCESS IS STILL INCOMPLETE IN SEVERAL AREAS OF THE COUNTRY

THE SECTOR: 650 COMPANIES OF WHICH ONLY 19% MANAGE THE SERVICE IN AN INTEGRATED MANNER

INCREASED PRESENCE OF FULLY PUBLIC OPERATORS (40%) According to the latest data provided by the *Utilitatis* database, the number of companies active in the management of the waste cycle is equal to over 650 (excluding economic management): 51% are specialised in the collection and transport phases, 19% have an integrated management (phases of collection and direct management of one or more waste recovery and/or disposal facilities), while the remaining 30% of companies are specialised in plant management. A large number of local authorities are active in the sector, managing the service or parts of it in-house, especially the collection of tariffs and the relationship with users.

From the point of view of company structure (Fig. 9), at the national level, the prevailing form is that of wholly public operators (40% in terms of inhabitants served), where listed or publicly controlled companies cover an area corresponding to 15% of the inhabitants, while mixed public-private companies account for 13% of the population; overall, publicly owned operators serve 68% of the inhabitants served. At the national level, *in-house* assignments affect 37% of inhabitants (Fig. 9), assignments to listed companies are around 10%, followed by assignments to joint enterprises (9%) and concessions to third parties (7%). 38% of the population live in areas where the service is awarded through tenders, the relatively short duration of which results in frequent turnover in service management.

FIGURE 9

TYPE OF ASSIGNMENT AND TYPE OF SHAREHOLDING OF COLLECTION AND INTEGRATED CYCLE OPERATORS [2022]



TYPE OF ASSIGNMENT



Source: Utilitatis calculations based on tendering data and operator information.

The assignment of the service is monitored by *Utilitatis*, which in 2014 established an observatory for the analysis of tenders.

87% OF INVITATIONS TO TENDER FOR A SINGLE MUNICIPALITY

85% OF ASSIGNMENTS HAVE A DURATION OF 5 YEARS OR LESS Out of the 2,499 tenders issued from 2014 to 2022 for the awarding of municipal waste management services, 58% are tenders for collection, sweeping and transport services, 23% concern the awarding of the entire integrated cycle, while 19% relate to the awarding of waste recovery or disposal services. In terms of size, 87% of the tenders analysed envisage the assignment of the service to a single Municipality.

Management fragmentation is also accompanied by a strong temporal discontinuity in the running of the service: approximately 85% of tenders for waste management services have a duration of five years or less. This results in a sudden change of management in the areas which, in the absence of strong local governance and long-term planning, may affect the possible levels of management improvement. Analysing the calls for tenders by type of activity awarded, an average duration of about 4 years is noted for the collection phases, while for the recovery and disposal activities, the average duration is 2.3 years.

There are 22 tenders launched in Italy, of which 19 have completed the procedure by identifying the operator (Fig. 10). The remaining 3 were not awarded because they were revoked, cancelled or interrupted.

FIGURE 10

TENDERS IN ITALY



Source: Utilitatis calculations regarding tenders

In 2021, the waste sector recorded almost EUR 13.5 billion in turnover (about 0.8% of the national GDP), employing more than 97,000 direct workers, which constitutes 0.39% of the total number of employees in Italy and 1.67% of the industrial sector's employment. This value is mainly generated by large companies, which are in the minority in numerical terms (Fig. 11), while small companies predominate in numerical terms. In terms of size, 48% of operators have a turnover of less than EUR 10 million per year, while 4% of operators have a turnover.

13.5 BILLION IN TURNOVER: 0.8% OF GDP AND 97,000 EMPLOYEES

FIGURE 11

DISTRIBUTION OF OPERATORS AND SECTOR TURNOVER BY SIZE CLASSES [YEAR 2021]



Source: Utilitatis and AIDA BvD data processing

INTEGRATED OPERATORS GENERATE 37% OF TOTAL TURNOVER

The analysis shows that collection operators represent 53% of the total operators, account for 38% of the total turnover and employ 53% of the total workforce (Fig. 12). Integrated operators represent 18% of the total operators, generate 37% of the total turnover and employ 37% of the total workforce. Complementarily, the category of facility operators forms the remaining 29% of companies, generating 24% of total turnover and employing 10% of the workforce.

FIGURE 12

DISTRIBUTION OF THE NUMBER OF OPERATORS, TURNOVER AND EMPLOYEES IN THE MUNICIPAL WASTE MANAGEMENT SECTOR BY TYPE OF ACTIVITY [YEAR 2021]



INTEGRATED CYCLE PLANT MANAGEMENT COLLECTION

Source: Utilitatis and AIDA BvD data processing

The financial analysis, conducted on a sample of 452 single-utility companies, shows how both the type of business conducted and the company size influence the economic performance of the operators (Fig. 13). The classification by activity shows that the economic margins of management are higher for the operators who manage the plants (EBITDA margin at 22%), while collection operators and integrated managers record a lower index (EBITDA margin at 12% and 11.7%, respectively).

HIGHER OPERATING MARGINS FOR FACILITY OPERATORS

SINGLE-UTILITY SAMPLE MARGINS BY ACTIVITY [YEAR 2021]



Source: Utilitatis and AIDA BvD data processing

With reference to the economic performance of the operators, a trend emerges from which no unambiguous indications of the correlation between turnover size classes and economic performance emerge (Fig. 14). Top operators show the highest return on equity and return on sales (ROE=15.6%; ROS=5.7%), while medium-sized operators show a higher return on investment ratio (ROI=4.3%).

FIGURE 14

FIGURE 13

PROFITABILITY RATIOS OF THE SINGLE-UTILITY SAMPLE BY ACTIVITY [YEAR 2021]



Source: Utilitatis and AIDA BvD data processing

With respect to the financial sustainability of the service, both on the household and non-household level, TARI expenditure takes on different values depending on the geographical areas of reference, maintaining a certain stability over time.

For the typical user consisting of 3 members in a 100-square-metre dwelling (Fig. 15), expenditure on the service in 2022 was €319, with large regional differences between macro-areas: €277 for the North, €335 for the Centre and €369 for the South. These differences have persisted over time: in the time span from 2014 to 2022, in the North, expenditure on the service remained at an average of EUR 272, in the Centre at levels above the average figure (EUR 332), as well as in the South (EUR 358).

TARI: SIGNIFICANT REGIONAL DIFFERENCES. FROM 369 EUROS IN THE SOUTH TO 277 EUROS IN THE NORTH

FIGURE 15

TREND IN EXPENDITURE PER USER OF 3 COMPONENTS 100 SQM – GEOGRAPHICAL AREA [YEARS 2014–2022; EUROS/YEAR]

			NORTH CENTRAL SOUTH AVERAGE							
355,7	355,5	351,7	357,8	356,2	358,6	355,7	358,6	368,7		
337,9	335,2	332,9	329,7	326 1	224 6	333,1	337,7	335,0		
311,5	312,1	310,1	311,3	310,5	311,2	313,1	319,3 • • • • •	319,0 • •		
265,9	269,2	268,6	269,6	271,2	272,3	272,7	282,1	277,0		
2014	2015	2016	2017	2018	2019	2020	2021	2022		

Source: Utilitatis calculations based on TARI approval resolutions

IN MORE POPULOUS MUNICIPALITIES, THE SERVICE COSTS MORE

Analysing the expenditure of households on TARI according to the population of their municipality of residence in the period from 2014 to 2022 (Fig. 16), it is observed that the most populous municipalities have the highest expenditure value (340 euro in 2022), the only one above the sample average (319 euro in 2022). The growth rate of expenditure in these municipalities remained relatively stable over the period considered (+0.38%). In the medium-sized and medium-large municipalities, similar expenditure values are to be found in 2022 (EUR 312 and EUR 295, respectively), despite the fact that they have experienced markedly different growth rates over the years (+12.21 and +0.95% from 2014 to 2022, respectively). Smaller municipalities have the lowest average expenditure value (EUR 236 in 2022) and a negative expenditure growth rate (-2.58%d in 2014 to 2022).

FIGURE 16

TARI EXPENDITURE TREND FOR THE 3-COMPONENT 100 SQM UTILITY - MUNICIPALITY PO-PULATION CLASS [YEARS 2014–2022; EURO/YEAR].

<=50.0	00 5	0.001 - 10	00.000	100.00	1 - 200.00)0 >2	00.000	AVERAGE
339,2	337,2	334,5	334,7	335,0	335,7	338,4	346,8	340,5
311,5	312,1	310,1	311,3	310,5	311,2	313,1	319,3	319,0
291,9	292,8	290,7	294,2	292,7	292,8	292,2	299,0	311,7 294,6
277,8	289,4	291,3	290,8	289,7	289,8	291,9	291,8	
242,7	232,1	225,3	232,8	226,1	229,4	230,8	234,0	236,4
2014	2015	2016	2017	2018	2019	2020	2021	2022

Source: Utilitatis calculations based on TARI approval resolutions

As is well known, with Law No. 205 of 27 December 2017, important aspects of the municipal and assimilated waste cycle were made subject to the independent regulation of ARERA, in a way that is ahead of the international context.

Since then, the main measures adopted by the Independent Regulator have primarily concerned the *Tariff Method* for the years 2018–2021 (known as the MTR) with Resolution 443/2019/R/Rif, the transparency of the service through Resolution 444/2019/R/rif³, the Tariff Method for the years 2022–2025 (Resolution 363/2021/R/Idr) – containing the important introduction of criteria for updating tariffs not only for integrated operators, but also for certain categories of facilities – and finally, the quality of service, with Resolution 15/2022/R/ ref.

The last mentioned measure on the tariff update rules, known as MTR-2, confirmed for collection operators and integrated operators⁴ the fundamental cost components and the identification of the maximum increase by means of a cross-check between the quality of the services (level and quality of separate collection) and the presence or absence of changes in management activities.

The identification of the productivity recovery coefficient, previously at the total discretion of the local authority in the range of 0.1% and 0.5%, has instead seen the introduction of an additional matrix, which cross-references performance quality and the comparison between the operator's actual cost per unit of waste produced and the standard requirement, thus attributing higher productivity recoveries to less efficient operators, although still never exceeding the value of 0.5%.

Further adjustments within the recognised costs were made through the introduction of the COEXP116 forecast tariff component, to take into account the possible effects of Legislative Decree No. 116 of 3 September 2020, such as higher charges from additional activities for the new waste classification of non-domestic users, and lower charges for the possibility given to non-domestic users to deliver waste outside the public service (in which case the component is expected to be negative). Another component, again of a forecasting nature, is QC, which is designed to intercept any additional costs associated with the implementation of service quality regulation.

The most innovative element of the tariff regulation was the determination of access tariffs for minimum treatment and disposal plants, defined as indispensable, i.e. characterised by a "*strong and stable excess demand*" (for waste treatment) and also by one of the following cases: i) facility capacity committed by guaranteed waste flows, for example, included in regional waste management plans or in Area Plans; ii) recognition by the competent bodies as a plant intended for completion of the cycle.

These conditions are indicative of conditions that tend to be monopolistic, and therefore subject to intervention by independent regulation, in the same way as the facilities of integrated operators already regulated in the previous MTR. Otherwise, the so-called additional facilities, being subject to market logic, would not require intervention in price formation.

The provisions for access tariffs for minimum installations therefore provide for a tariff factor subject to a growth limit, currently quantified as the sum of forecast inflation and a *proxy* for the technological and environmental characteristics of the installation, with a maximum value of 4%. This approach has been called into question to date by at least four rulings of the Lombardy Regional Administrative Court⁵ which, accepting the petitions submitted by some operators, have sanctioned the partial annulment of the MTR-2. The main reasons would mainly concern the inappropriateness of the identification of minimum facilities – and implicitly of flows – by the Regions, as envisaged by ARERA, whereas the choice would instead be, according to the Testo Unico Ambientale (TUA), a national planning act. Rather than questioning the regulatory system downstream of the choice of minimum facilities,

THE REGULATORY FRAMEWORK IS ENRICHED WITH CONTRACTUAL AND TECHNICAL QUALITY

ACCESS TARIFFS FOR "MINIMUM" FACILITIES

PARTIAL NULLIFICATION OF MTR-2 BY THE TAR

³ It includes the minimum information elements to be made available on operators' websites, in collection documents and individual communications addressed to users.

⁴ Integrated operators are those who, in addition to the management of at least one of the upstream services of the waste cycle, are required to stratify in their accounting records the completion of the cycle processing facilities.

⁵ These are the Lombardy Regional Administrative Court rulings nos. 486/2023, 557/2023 and 578/2023, against which ARERA appealed to the Council of State through del. 91/2023/C/ref and del. 118/2023/C/rif.

the Regional Court therefore points to the lack of competence in their identification. The Council of State, to which ARERA has applied for a suspension of the TAR rulings, will rule on the merits no earlier than next November.

Based on the same allocation of facilities, the latest tariff method pursues the management of flows according to the waste hierarchy (introduced by Directive 2008/98 and transposed into national law by Article 179 of Legislative Decree No. 152 of 3 April 2006). In fact, equalisation components Crec, Cinc and Csmal should be applied to the gate tariffs of completion-of-cycle facilities, to be paid to the Cassa per i Servizi Energetici e Ambientali (CSEA) as an incentive or disincentive, depending on the positive or negative externalities resulting from waste disposal (or recovery/disposal), penalising, for instance, landfilling or incineration without energy recovery, whether they are minimum or additional completion-of-cycle facilities. The promotion of these components started in December 2022 with consultation 611/2022/R/rif.

To date, tariff approvals for the period 2018–2021 – thereby pertaining to the first regulatory period – covered an underlying population of more than 22 million inhabitants, while approvals for the years 2022–2025, based on the previous year's approvals, covered an underlying population of more than 6 million inhabitants.

The PEF values approved reached EUR 5 billion for the first regulatory period, and close to EUR 1.3 billion for the second, involving for the latter, as ETCs, 9 municipalities and 12 Area Government Agencies (EGAs/Enti di governo dell'ambito), the latter including 131 municipalities. The breakdown of tariff revenues by predisposing entity shows that the municipalities involved as ETCs are large, with PEF values accounting for 49% of the total approved ones.

FIGURE 17

APPROVED TARIFF PLANS BY COMPETENT ENTITY: PERCENTAGE WEIGHT OF TARIFF REVE-NUE AND NUMBER OF MUNICIPALITIES COVERED [MTR-2, YEAR 2022 – STATUS OF APPRO-VALS MAY 2023]



Source: Utilitatis and calculations based on ARERA PEF approval resolutions

The planning of a PNRR-linked investment plan is creating an opportunity to improve the infrastructure of the environmental sector, which could play a central role in the acceleration of economic recovery and ecological transition. The resources made available by the PNRR on the M2C1 component amount to 2.1 billion euros, almost entirely allocated, 60% of which is earmarked for the South. This is less than the volume of projects submitted by companies, which totals more than 7 billion euros. According to an estimate by Utilitalia in 2023, moreover, in order to meet the European targets, by 2035, facility requirements – primarily for the processing of the organic fraction and for incinerators with energy recovery – are estimated at around EUR 4–5 billion. Investments that, in terms of invested value per tonne of waste treated, suggest an amount of €600 per tonne for incineration facilities with energy recovery. To these must be added EUR 600 million in investments for the commissioning of the 10% residual landfill requirement; EUR 1.2 billion for the increase

PNRR: 2.1 BILLION EUROS FOR THE SECTOR OF WHICH 60% IN THE CENTRAL SOUTH

INCENTIVES FOR

MANAGEMENT

MODELS

WASTE HIERARCHY

APPROVED PEF MTR-2

FOR 1.3 BILLION EUROS

6–7 BILLION EUROS REQUIRED BY ITALIAN FACILITIES TO COMPLETE THE CYCLE

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in separate waste collection, and a further EUR 300 million for the implementation of the quantity-based waste tariff: in total, this amounts to EUR 6–7 billion (i.e. between EUR 0.5 and 0.6 billion per year).

One of the objectives of the PNRR action lines was to finance innovative facilities for the recycling not only of classic product fractions (primarily organic waste), but also of fractions that are often difficult for citizens to separate, such as waste electrical and electronic equipment WEEE and textile waste.

The pandemic and geopolitical crises have emphasised the vulnerability of supply chains of critical raw materials (e.g. precious metals, rare earth elements), which are crucial for the energy and ecological transition. The sustainable raw material supply plan must include a solution that integrates primary extraction with the recycling of raw materials. A very concrete example in this sense is represented by WEEE. In 2022, the total amount of WEEE collected in Italy will be about 360 thousand tonnes, slightly down from 2021 (384 thousand tonnes). Similarly, the average per capita collection figure in recent years has remained fairly constant at around 6 kg of WEEE per inhabitant (Fig. 18), still far from the European Community's targets of 12 kg per inhabitant per year to be collected and the European average collection rate (10 kg per inhabitant). Therefore, to improve the security of supply of critical raw materials, a solution must necessarily come from improving the WEEE management chain. From collection to recycling, the end-of-life management of these appliances must necessarily be implemented not only to meet European targets but also, as mentioned, especially to decrease the sourcing of raw materials from non-EU countries.

FIGURE 18

REGIONAL PER CAPITA COLLECTION OF WEEE IN ITALY IN 2022



WEEE FOR THE RECOVERY OF "STRATEGIC MATERIALS"

IN ITALY STILL 6 KG/ INHABITANT WEEE COL-LECTED. FAR FROM EUROPEAN OBJECTIVES (12 KG/INHABITANT PER YEAR)

ORGANIC WASTE GROWS BUT FACILITIES ARE LACKING, ESPECIALLY IN THE CENTRAL SOUTH The impetus of the PNRR does not only stop at the interception of valuable elements such as those contained in WEEE, but also at the proper management of organic waste. With about 7.4 million tonnes of waste, the organic fraction is the main component of municipal waste, growing in all areas of the country. The treatment of this fraction takes place mainly in integrated anaerobic/aerobic facilities (47.6 per cent of the total) and composting facilities (47.6 per cent), while the remaining 4.8 per cent is managed in anaerobic digestion-only facilities. These facilities today ensure the overall balance at the Italian level, but they are unbalanced across the region and will not be sufficient to handle the increase in production expected in the coming years as a consequence of meeting European targets. The estimate of facility requirements for the treatment of organic fraction by 2035 (Fig. 19) shows that only the North and Sardinia will be self-sufficient, while the Centre, the southern peninsular and Sicily will have a significant deficit. The deficit in the Centre is comparable to the currently available capacity, while that in Sicily and the Southern Peninsula will be more than 130% of the currently installed capacity.

FIGURE 19

COMPARISON OF THE DEFICIT AT 2035 WITH THE CURRENT AVAILABLE CAPACITY



Source: Utilitalia calculation based on ISPRA data

The textile sector is considered by the European Commission's Circular Economy Action Plan to be the fourth largest sector in terms of raw material, water and land use (after food, construction and transport) as well as the fifth largest in terms of emissions. For this reason, the European circular economy strategies envisage improving the efficiency of the management of by-product waste, a factor that has imposed, as of 1 January 2022, the separate collection of textile waste throughout Italy (to date activated by 72% of Italian municipalities). The current per capita collection of 11 kg per inhabitant per year represents only 16% of the total produced considering all types of textile waste, whereas, considering only clothing, this percentage would be 21.6%. The obligation of separate collection will therefore lead to an increase in textile waste, which will have to be properly managed. In addition to the interception difficulties, there are also technological issues related to recycling and the materials used at the outset. Investments in new sorting and recycling technologies should be an essential contribution to circularity goals, through the implementation of the waste prevention principle and the closing of the fibre-to-fibre material cycle. The introduction of an Extended Producer Responsibility model could help generate environmental benefits (decreasing the use of soil, water and chemicals and saving 4.0 to 4.3 million tonnes of CO2 emissions), social benefits (15,000 new green jobs in Europe) and economic benefits (profits of between 1.5 and 2.2 billion euros).

72% OF ITALIAN MUNICIPALITIES HAVE INITIATED THE COLLECTION OF TEXTILES

NEW TECHNOLOGIES AND EPR SYSTEMS TO COMPLETE THE TEXTILE WASTE CYCLE



Promote knowledge, innovation and best practices in the management of Local Public Services.

The Utilitatis Foundation is the fruit of a journey that began in 1995 with the establishment of the Istituto di ricerca sui servizi pubblici/Italian public services research institute, the then Proaqua, at the behest of Federgasacqua (now Utilitalia). Since its inception, it has taken the form of a non-profit consortium aimed at study and research activities of a technical-economic nature, as well as assistance to administrations or companies involved in service reorganisation processes.

In 1999, the institute expanded its research activities, at first focusing exclusively on the integrated water service, to other local public services, such as the natural gas distribution service and the municipal waste management service, transforming itself into the CRS-PROAQUA public utilities research centre. In 2006 the Research Centre took on its current name, UTILITATIS pro acqua energia e ambiente.

In May 2011, the consortium was transformed into a Foundation, strengthening its mission as an entity oriented towards promoting the culture of local public service management and the dissemination of legal, economic and technical content.

In 2021, the Founder Promoter, Utilitalia, supported the functional redesign of the Foundation, relaunching its study and research activities, increasing its scientific standing and, at the same time, developing its business activities with regard to both training and consultancy, also outside the federal sphere.

The Foundation's aim is to promote knowledge, innovation and best practices in the management of Local Public Services, improving their quality and efficiency as well as their economic, social and environmental sustainability, orienting the business model towards sustainable success, i.e. the stable creation of long-term value for its shareholders, in a form shared with the relevant stakeholders.

The Foundation's activities focus on the drafting of periodical publishing products in the sector such as the Blue Book and the Green Book, monographs dealing with technical, economic and governance aspects of the water and waste service, which contain proprietary data of the managers; the Orange Book, dedicated to innovation in public utilities; the Utilities Sustainability Report, which collects the extra-financial performance of Utilitalia's members; and on collaboration in study and research projects with other Italian and foreign research centres and foundations.