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Ten years of recycling sectors on the eve of the transposition of EU Directives on circular economy

Over the decade 2006-2016¹, the last available year, waste management in Europe progressively shifted towards recycling: while the total waste production was nearly steady at 2.5 bln t, material recovery increased from 1,029 to 1,102 Mt (+7%).

Over the same period, total waste production in Italy increased from 155 to 164 Mt (+6%) and recycling increased from 76 to 108 Mt (+42%).

Over the last ten years, the Italy of Recycling Report has been monitoring the various trends and dynamics developed over the time in the various sectors. The results reached by some of the main materials are shown below.

Many recycling sectors have achieved good performances in these years, with positive results at both European and Italian level. For **packaging waste**, for example, recycling in the EU28 increased by 27%, from 46 Mt in 2006 to 58 Mt in 2016: over the same period, Italy records an increase from 6.7 to 8.5 Mt, with a percentage increase equal to the European one. The recycling rate over the amount released for consumption in the EU28 increased from 57 to 67% while in Italy it increased from 57 to 65%, in line with the European data, as well as with the new European targets of 65% in 2025 and 70% in 2030. Compared to the main European economies (Germany, France, Spain and the UK), Italy ranks third behind Germany (71%) and Spain (70%).

Also, specific packaging waste sectors show good results over the examined period, with some particular characteristics, as shown below.

PAPER AND CARDBOARD. Packaging recycling in Italy increased from 3,291 kt in 2009 to 3,981 in 2018, with a 690 kt increase (21%). Over the total amount of paper and cardboard packaging released for consumption, the recycling rate increased from 80 to 81%, compared to a European target of 75% in 2025 and 85% in 2030.

At the European level, the recycling rate for paper and cardboard packaging, as compared to the amount released for consumption, increased from 83% in 2009 to 85% in 2017 (last available year): Italy, as compared to the main European economies, ranks third behind France (98%) and Germany (88%).

Over this decade, paper and cardboard recycling has increased slowly, as it was already showing a high performance ten years ago: in fact, the recycling rate has already met the 2025 target. High energetic costs faced by paper mills and the unsolved problem of recycling scraps limit a further growth in the sector.

GLASS. Packaging recycling increased from 1,362 kt in 2009 to 1,886 in 2018, with a 524 kt increase (38%). Over the total amount of glass packaging released for consumption, the recycling rate increased from 66 to 76%, compared to a European target of 70% in 2025 and 75% in 2030.

At the European level, the recycling rate for glass packaging over the amount released for consumption increased from 68% in 2009 to 74% in 2017 (last available year): compared to the main European economies, Italy ranks third behind Germany (84%) and France (78%).

In the light of the developments in waste collection, treatment, and recycling observed over this decade, this sector can employ all the national collectable material in the production of new packaging, but there is a urgent need to increase the national glass packaging treatment capacity as well as to identify solid end markets for scraps derived from the recovery and recycling processes.

PLASTIC. Packaging recycling increased from 701 kt in 2009 to 1,020 in 2018, with a 319 kt increase (45%). Over the total amount of glass packaging

1. EUROSTAT time series.

Italy of Recycling 2019

released for consumption, the recycling rate increased from 33 to 45%, compared to a European target of 50% in 2025 and 55% in 2030. At the European level, the recycling rate for plastic packaging over the amount released for consumption increased from 32% in 2009 to 42% in 2017 (last available year): compared to the main European economies, Italy ranks third behind Germany and Spain, both at 48%.

Over the decade considered, plastic packaging recycling increased significantly but, in order to comply with the new European targets, it is essential to overcome technical and economic obstacles that, to day, do not allow recycling for some types of polymers, such as mixed plastic. Investments in research and innovation are thus essential, as key elements in the transition of the plastic sector towards circular economy.

Furthermore, the EU Directive on single-use plastic poses new challenges, setting for the first time a minimum target for reuse of recycled material in primary production of PET beverage bottles (as of 2025, bottles up to 3 liters will have to contain no less than 25% of recycled plastic and, as of 2030, the recycled plastic content will grow to 30%, calculated as the average of the weight of such bottles released for consumption).

Such measure will improve the market outlet for recycled materials and will stimulate an increasingly collaborative discussion between the producers of such bottles and the recycling sector, in order to meet the quality requirement of recycled materials, as well as to share a joint development of solutions to be implemented.

The Directive also introduces bans or restrictions on the sale of not easily recyclable products (e.g. cotton bud sticks, plates, cutlery, etc.), as well as measures aimed at reducing sales of some single-use plastic items.

WOOD. Packaging recycling increased from 1,208 kt in 2009 to 1,926 in 2018, with a 718 kt increase (59%). Over the total amount of wood packaging released for consumption, the recycling rate increased from 58 to 63%, compared to a European target of 25% in 2025 and 30% in 2030.

At the European level, the recycling rate for

wood packaging over the amount released for consumption increased from 38% in 2009 to 40% in 2017 (last available year): compared to the main European economies, Italy ranks second, behind Spain, (67%).

Among the most relevant aspects of the last decade, the development of public separate collection systems should be mentioned, including the implementation of such collection in areas that were lacking systems to collect the wood component, that would then go to landfill. Such increased availability of material allowed to replace, almost entirely, virgin wood with scraps from wood panels.

ALUMINIUM. Aluminum scraps recycling increased from 683 kt in 2009 to 981 kt in 2018, with a 298 kt increase (44%). From 2009 on, primary aluminum production progressively decreased in Italy, ceasing completely in 2013. In the country, only secondary aluminium from recycling is produced, deriving from both internal recovery (from scraps coming from rolling and extrusion processes, integrated with re-melting machines) and pre-consumption (from industrial processes) and post-consumption (dismantling means of transport, building demolitions, waste from consumer goods and packaging).

Over the same period, aluminium packaging recycling increased from 31 kt in 2009 to 54 kt in 2018, with a 23 kt increase (74%). Over the total amount of aluminium packaging released for consumption, the recycling rate increased from 51 to 80%, as compared to a European target of 50% in 2025 and 60% in 2030.

With the results of aluminium packaging recycling over the last ten years, this sector has already met the European 2030 target, thanks to the increase in the share of the different packaging types in the separate collection and to the maximization of recycling for some types of packaging waste, that were previously not recovered (e.g. coffee capsules).

STEEL. Scraps recycling increased from 12.8 Mt in 2009 to 12.9 Mt in 2018, with a 100 kt increase. In 2018, recycled scraps from Italy accounted for 54% of steel production, while it accounted for 65% in 2009.

Italy of Recycling 2019

Steel packaging recycling increased from 356 kt in 2009 to 387 in 2018, with a 31 kt increase (8%). Over the total amount of steel packaging released for consumption, the recycling rate increased from 78 to 79%, compared to a European target of 70% in 2025 and 80% in 2030. While the sector has already met the 2025

recycling target and is about to meet the 2030 target, it still has challenges to face: the increased in steel products obtained from recycled steel and, especially, the shift from blast furnace steel production (which is energy intense and has high environmental impact) to the production from renewable sources.

The Italy of Recycling also monitors sectors other than packaging

RUBBER AND END-OF-LIFE TIRES. Over the years covered by available data (2013-2018), ELTs recycling increased from 136 to 176 kt, with a 40 kt increase (29%). Over the total amount of tires managed, the recycling rate increased from 43 to 58%.

Since 2011, this sector is regulated by the Extended Producer Responsibility (EPR) scheme, which has been partly effective in contrasting spills and waste dumping, while the problem of ELT from the black market and with no environmental contribution is still unsolved.

Increased material flows allowed companies to plan numerous and significant mid and long-term investments, and to implement processes aimed at improving the product quality, thus producing output materials that are increasingly able to meet the market demand. However, at the national level, it is still difficult to sell both raw materials and manufactured goods, due to the delay in the approval of the so-called End of Waste decree.

WASTE FROM ELECTRICAL AND ELECTRONIC EQUIPMENT. Over this decade, WEEE sector collection has increased from 193,043 t in 2009 to 310,611 t in 2018, with a 117,568 t increase (61%).

Considering latest available per-capita data, Italy grows from 3.2 kg per person in 2009 to 4.1 kg per person in 2016, a very slow-pace growth, hence the collection reached the 42% of the average weight of WEEE released for consumption in the previous three years, which is still far from European targets of 45% in 2016 and 65% in 2019.

Such delay in Italy is even more alarming if compared to the performances of the other European countries: the UK in 2017 reached 13 kg per person, France 10.1 kg per person and Germany 9.1 kg per person.

Over the next years, an increase in WEEE collection will be essential in order to bridge the gap and meet the European targets, through the implementation of a collection network, and the fight against illegal waste disposal and illegal WEEE market.

PORTABLE BATTERIES AND ACCUMULATORS. Between 2013 and 2018, the recycling rate increased from 8,420 t to 10,432 t, with a 2,012 t increase (+24%). Over the same period, the collection rate, as compared to the amount released for consumption, increased from 36 to 42%, with a 45% target in 2016.

At the European level, the collection rate increased from 37% in 2013 to 46% in 2016: Italy ranks in the last place among the European countries in the collection rate of portable batteries and accumulators.

In order to meet the mandatory targets, it will be necessary to ensure an even collection network, as well as to invest on citizens information and awareness in order to reduce the disposal of batteries as unsorted waste.

MINERAL OIL WASTE. Over the last ten years, the mineral oil waste sector saw an increase in the regenerated oil from 100 kt in 2009 to 123 kt in 2018, with a 23 kt increase (+23%).

While, over this period, the collection rate was close to 100% of the total collectable oil, it still is important to act and invest in information and education of both companies and citizens, in order to stress the attention on waste, that allowed to achieve, over the years, significant results in environmental protection.

Future challenges relate to innovations introduced by the Circular Economy Package, in the Framework Directive, especially in relation to the strengthening of EPR obligations, through a broader involvement of the initial waste holder.

END-OF-LIFE ANIMAL AND VEGETABLE OILS AND FATS. Over the last ten years, the sector of end-of-life animal and vegetable oils and fats saw an increase in the amount collected and recycled from 42 kt in 2009 to 76 kt in 2018, with an 81% increase.

The evolution in this sector is tangible in the yearly collection data: there was a shift from an undervalued use of end-of-life vegetable oil to a broad use in various sectors, including biodiesel production. The main problems of the sector include a low perception of the pollution potential of end-of-life vegetable oil and fats from food products, thus resulting in an underestimation of the environmental impacts caused by mismanagement. Increased information and consciousness by users are thus essential to increase awareness and improve the collection rate.

ORGANIC FRACTION AND SEWAGE SLUDGE. Over a decade, the collection of the organic fraction increased from 3.3 Mt in 2008 to over 6.6 Mt in 2017, with a 3.3 Mt increase (100%). The sector also saw a continuous increase in the treated volumes and in the dedicated plants, especially those including an anaerobic digestion treatment at the beginning of the process.

Meeting the targets set by the Circular Economy Package (especially the obligation to the separate collection of organic waste by 2023) will entail two main challenges to overcome: managing by 2023 over 2 Mt/year of organic waste in addition to that produced today and the resulting need for adequate plants so to ensure effective recycling. An update of the facilities

network will be needed especially in Central and Southern Italy, and existing plants will need to be upgraded in order to produce biomethane.

INERT CONSTRUCTION AND DEMOLITION WASTE. Material recovery data for C&D waste published by ISPRA are available from 2013 on. Over the last four years (2013-2017) the C&D waste sector registered an increase in waste production from 48 to 56 Mt (+17%), while the recovered quantity rose from 36 Mt in 2013 to 42 Mt in 2017 (+6 Mt), with a 16% rise. However, the recycling rate was almost unchanged.

Over the last decade, the inert waste recovery sector suffered widely the crisis affecting the construction sector. The lack of large-scale infrastructures and the fact that items related to recycled and artificial aggregates are not included in tender specifications and in regional price lists caused a robust demand decline for such materials, resulting in unsold production storage in recovery facilities or in its use as infill material. In addition, the lack of adequate end of waste criteria made inert waste recovery activities very uncertain.

END-OF-LIFE VEHICLES. In the past ten years, reuse and recycling moved from 1,212 kt in 2007 to 896 kt in 2016, showing a 316 kt reduction mainly due to a decrease in the number of end-of-life vehicles produced. However, the reuse and recycling rate does not show a positive trend, as it only registers a 1-percentage-point increase in ten years (from 82% to 83%), and it is today below the 85% target that was planned for 2015. Total recovery decreased from 1,224 kt in 2007 to 897 kt in 2016, while the rate of total recovery with respect to the amount of generated waste stopped at 83%, which is quite distant from the 95% target that was planned for 2015.

The sector registers some structural lacks that have been continuing during the years, and no progress has been recorded, in particular for what concerns energy recovery. The waste produced by shredding plants, i.e. the car fluff, represents the major fraction that is sent to disposal and constitutes a main issue in the sector. A proper decontamination of vehicles, given the calorific value of car fluff which is mainly composed by organic matters, would enable an efficient energy recovery.

Italy of Recycling 2019

A focus section carried out by Ecocerved, based on data from the Environmental Declaration, relates to the **PRODUCTION OF SECONDARY RAW MATERIALS (SRM)** for some waste streams. This second edition of the analysis highlights that in 2017 companies in the recycling sector treated 18 Mt of paper, glass, plastic, wood, rubber and organic waste, almost 15% more than in 2014. Consistently with the higher recovery rate, the study registers a higher production of secondary materials coming from recycling the above-mentioned matrices, with a total of 12 Mt of SRM.

The average process yield (the rate between SRM output and waste input) amounts to 67%. The paper sector registers the highest process yield, over 90%; glass and wood rates are around 75% and 80%, while for rubber it almost reaches 65%.

Compared with 2014, there appears to be no relevant progress in terms of efficiency in the transformation from waste to SRM; it can be noted, however, that for organic waste the process yield rate increased from 27% in 2014 to 29% in 2017, which represents, proportionally, the most remarkable performance.

Within the overall management scheme, a particularly interesting aspect arises in the output phase: even if recyclers are treating higher quantities, in 2017 the amount of waste at the end of its production cycle was nearly the same as in 2014, showing a better performance in the processing which is also fostered by a higher quality in the collection and input selection. In addition, more than 30% of output waste is circulating within the sector, hence constituting a process input to other recyclers.

The study also proposes, for the first time, an examination of the **authorizations to waste managers**, which have been collected since 2018 through the MUD. In particular, it has been observed that a relevant share of authorizations is expiring by the end of 2020: for what concerns recovery processes for the production of SRM, this issue concerns 60% of the total amount of material production in the glass and wood sectors and 40% in the paper sector, while for plastic, rubber and organic sectors this time horizon only concerns recyclers that produce today between 15% and 30% of the related SRMs.

The challenge of circular economy in the European waste management policy

On the occasion of the tenth edition of this Report, we believe it is useful to dwell on the development of this evolution in order to comprehend the more disruptive aspects and, in particular, further developments that we might expect in the future.

To this end, a brief reconstruction of the phases.

In 1975, the first Directive of the then EEC² motivated the need to adopt a unified regulation because “any disparity between the provisions on waste disposal already applicable or in preparation in the various Member States may create unequal conditions of competition

and thus directly affect the functioning of the common market; ...it is therefore necessary to approximate laws in this field...”. The main objective was then merely a commercial one. The legislator wanted to prevent that possible lower administrative costs might cause economic advantages when determining the price of goods, and allow States to alter competition through adopting a regulation with different degrees of stringency. Nevertheless, at the time the legislator was already aware of health and environmental concerns because of waste, so much that the regulation was designed to aim at environmental protection, quality of life and of health, and that the *recovery of waste* should

2. Directive 75/442/EEC

have been *encouraged in order to conserve natural resources*.

In Italy, the decisive turning point was then realized by the Legislative Decree n. 22 of 1997, which has been a real framework law that reordered the sector and anticipated the following European Directive, in particular for what concerned the application of waste hierarchy, by giving priority to recycling and its development, and by counting on separate collections and on the management of responsibility, both extended for the producers and shared with other players of the field. The turning point was then enshrined in 2008, with the Directive 2008/98, which definitely turned waste management policy towards environmental sustainability, as it established that “the first objective of any waste policy should be to minimise the negative effects of the generation and management of waste on human health and the environment. Waste policy should also aim at reducing the use of resources, and favour the practical application of the waste hierarchy”.

Hence, completely new aims have been introduced: the matter is not only about waste management, but also about waste production. Waste ceases to represent a potential market distortion and becomes an indicator for inefficiency and unsustainability in our consumption and production models. The Directive 2008/98/EC has marked a significant step: a regulation that was first set to ensure a safe and controlled waste management, is now set towards a sustainability-oriented model. The Directive, indeed, introduced: the obligation to adopt prevention programs; by-products regulation and end-of-waste regulation; new recycling targets for some categories of materials

involved in municipal waste, and in construction and demolition waste; a mandatory separate collection for some fractions.

With the circular economy oriented reform approved in 2018³, waste policy is now organically included in a strategy that aims at:

- a prudent, efficient and rational utilisation and management of materials, as well as their circular utilisation in order to minimize the extraction of natural resources, the related energy consumption and waste disposal;
- hence, a reduction of environmental impacts, including climate impacts, and a reduction of the dependence of the European Union on raw materials import, along with improving efficiency and economic competitiveness.

The 2018 reform operated by identifying the most critical aspects at the starting position, also accounting for consumption trends and for products evolution. On the basis of such recognition, it then provided for: increasing the targets for preparation to utilisation and recycling; expanding the waste categories involved by separate collections; strengthening prevention; fostering the use of economic tools to support the transition towards circularity; setting limits to disposal; avoiding the overcapacity of waste management and energy recovery plants; introducing methods to compute effective recycling; simplifying procedures for the identification of by-products and end-of-waste. In conclusion, it means to support recycling markets, innovation, the restructuring of production processes, and new forms of consumption.

3. Directive (Eu) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste

The evolution of waste policy

Waste separation is crucial for improving the quality of recycling of waste materials. The following table reports the deadlines that Member States need to meet to ensure a separate

collection of the different waste streams. Starting from the next year, seven collection targets are to achieve concerning different streams.

Table 1 Targets for specific waste streams

Type of waste	Year	SC Target
WEEE	2006	Min. 4 kg /inhab/year
Waste batteries	2012	25%
End-of-life vehicles	2015	100%
Municipal waste	2015	Paper, metals, plastic, glass
Waste batteries	2016	45%
WEEE	2016	Min. 45%
WEEE	2019	Min. 65% or 85%
C&D waste	2020	Wood, mineral fractions (cement, bricks, tiles and ceramic, stones), metals, glass, plastic, plaster
Waste oil	2020	Separate conferral
Organic waste	2023	Separate conferral
Waste from fishing gear containing plastic	2024	Separate conferral
Municipal waste	2025	Textiles, hazardous waste
Beverage bottles with a capacity up to 3 litres, including their caps and lids	2025	77%
Beverage bottles with a capacity up to 3 litres, including their caps and lids	2029	90%

Source: Sustainable Development Foundation

Reduction of the quantity of landfill waste

Another area for intervention of the European waste policy also concerned the reduction of landfill waste. This kind of disposal constitutes, in fact, the symbol of linear economic and needs to be reduced as much as possible, aiming at its zeroing.

In the beginning, interventions only involved biodegradable fraction, at first also to

contrast methane emissions deriving from its fermentation in anaerobic environment. This measure has represented the first act towards the limitation of landfill disposal. The following step has been to impose, by 2035, that maximum 10% of municipal waste produced in the year is conferred to landfill.

Table 2. Target for reduction of landfill waste

Type of waste	year	Percentage of reduction of landfill waste
Reduction of landfill disposal of biodegradable waste	2006	Reduction by 75% compared to 1995 levels
	2009	Reduction by 50% compared to 1995 levels
	2016	Reduction by 35% compared to 1995 levels
Municipal waste	2035	Max. 10% conferrable to landfill

Source: Sustainable Development Foundation

Recovery

In order to reduce waste disposal, recovery needs to be maximized. It is in this sector that the European legislator has marked the best improvements in waste management, by defining minimum targets for different sectors.

at first, targets have been set for packaging, in the 1994 Directive with a deadline in 2001. As it can be noted in the table below, it went from a minimum recycling target of 25% (in 2001) to a total of 70% by 2030.

Table 3. Recycling and recovery targets for packaging waste

Type of waste	Year	Percentage of recovery	Percentage of recycle
Total packaging	2001	50-65%	25-45%
Total packaging	2008	60%	55-80%
Glass	2008		60%
Paper and paperboard	2008		60%
Metals	2008		50%
Plastic	2008		22,50%
Wood	2008		15%
Total packaging	2025		65%
Glass	2025		70%
Paper and paperboard	2025		75%
Ferrous metals	2025		70%
Aluminium	2025		50%
Plastic	2025		50%
Wood	2025		25%
Total packaging	2030		70%
Glass	2030		75%
Paper and paperboard	2030		85%
Ferrous metals	2030		80%
Aluminium	2030		60%
Plastic	2030		55%
Wood	2030		30%

Source: Sustainable Development Foundation

Another historical sector relates to end-of-life vehicles, where very ambitious targets are set: the legislator requires recovery and reuse of at least 95% of end-of-life vehicles and their parts.

Table 4. Recycling and reuse targets for end-of-life vehicles

Type of waste	Year	Percentage of recovery	Percentage of recycle
End-of-life vehicles	2006	85% including reuse	80% including reuse
End-of-life vehicles	2015	95% including reuse	85% including reuse

Source: Sustainable Development Foundation

Another waste stream that is ruled by a specific regulation is WEEE, whose importance is due not only to the increasing consumption, but also because it contains materials that involve high economic and strategic value, and their supply is at risk.

Table 5. WEEE recycling and reuse targets

Type of waste	Year	Percentage of recovery	Percentage of recycle
WEEE, category 1 (large household appliances) and 10 (vending machines)	2006	80%	75%
WEEE, category 3 (computer and telecommunication equipment) and 4 (consumer equipment)	2006	75%	65%
WEEE, 2 (small household appliances), 5 (lighting equipment), 6 (electrical and electronic tools), 7 (toys and sports and leisure appliances), and 9 (monitoring and control instruments)	2006	70%	50%
WEEE, exhaust gas from bulbs	2006		80% including reuse
WEEE, category 1 (large household appliances) and 10 (vending machines)	2015	85%	80%
WEEE, category 3 (computer and telecommunication equipment) and 4 (consumer equipment)	2015	80%	70%
WEEE, 2 (small household appliances), 5 (lighting equipment), 6 (electrical and electronic tools), 7 (toys and sports and leisure appliances), and 9 (monitoring and control instruments)	2015	75%	55%
WEEE, exhaust gas from bulbs	2015		80%
WEEE, categories 1 and 4, annex III	2018	85%	80%
WEEE, category 2, annex III	2018	80%	70%
WEEE, categories 5 and 6, annex III	2018	75%	55%
WEEE, category 3, annex III	2018		80%

Source: Sustainable Development Foundation

Italy of Recycling 2019

The problematic nature of municipal waste management, which derives from the complex composition of such stream, has pushed Europe to set increasing recycling targets also in this sector. By 2035, the preparation for reuse and recycling needs to reach 65% of the municipal waste produced.

Table 6. Recycling targets for municipal waste

Type of waste	Year	Percentage of recycle
Municipal waste	2020	50% paper, metals, plastic and glass
Municipal waste	2025	55%
Municipal waste	2030	60%
Municipal waste	2035	65%

Source: Sustainable Development Foundation

Two more waste streams need to be added to this review: C&D waste, whose recovery needs to reach at least 70% by 2020, and plastic packaging, which by 2030 will only be allowed to be released in the market if reusable or easy to recycle.

Conclusions

Overall, waste recycling in Italy continued to step forward in the past ten years, for the relevant quantities involved and for the improvements undergone by plants and treatment technologies. For the upcoming transposition of the new European Directives, which demand even more advanced targets, the Italian recycling system appears to be already well set up.

A focused intervention will be needed in order to maintain the conquered positions, to overcome persisting lacks and to make further progress. To improve municipal waste recycling, there is need to continue increasing the quantities and to improve the quality of separate collection, making up for delays in some cities. In addition, it is necessary to adequate the needs for treatment and recycling plants, which are still particularly lacking in some Regions. Recycling activities have suffered from the Sentence by the Council of State from the beginning of last year, and from the law that is included in the “Sblocca Cantieri” from this year, which together have curbed both new end-of-waste authorizations, and the renewal of existing ones. In addition to this, there is also the substantial delay in the publication of end-of-waste ministerial decrees.

After a long and tiring negotiation, the law has been modified, allowing Regions to authorize, also without national ministerial decrees and based on homogenous European conditions and criteria, to authorize case by case the recycling of end-of-waste products; however, the new law has been equipped with a control system that appears cumbersome and scarcely effective, whose impacts will have to be seen in practice.

Waste recycling plays a central role for the implementation of a circular economy model: the effectiveness needs to be verified also for what concerns the use of secondary raw materials in the same supply chain of the products where SRM have been generated, hence paying attention to the share of recycled materials contained in products. To this aim, we

need to get used to considering not only the recycling rates of products that become waste, but also the contribution from recycled materials to the overall materials demand, which is called Circular Material Use (CMU) rate, or more simply “circularity rate”.

In the EU, the circular material use rate in 2016 reached 11,7%, while Italy registered a 17,1%, which was lower than in the Netherlands (29%), in Belgium (20,6%), in France (19,5%) and in the United Kingdom (17,2%): hence, Italy performs well but is still in the fifth position in Europe. Since between 2010 and 2016 the circular material use rate has increased from 17,5% to 19,5% in France, and from 14,6% to 17,2% in the United Kingdom, while in Italy it has decreased from 18,5% in 2014 to 17,1% in 2016, one needs to bear in mind that circularity trends may show difficulties.

Because in the same years waste recycling rates have increased, as showed above, the reduction of the circularity rates may be explained by the fact that primary materials coming from recycling have been substituting the primary raw materials employed in the manufacturing of products in a nonequivalent way, and with lower quantities with respect to recycling volumes.

The issue is well-known for some sectors: the rubber-granules produced from recycling end-of-life tires is not used in the production of new tires; the vast majority of recycled inert waste from the construction and demolition sector is not used to substitute raw gravel and sand for the production of aggregates; only a little part of recycled plastic is used to produce new plastic bottles, and so on.

With a view to circular economy, more attention will have to be paid – together with research, technology innovation and economic tools – to the promotion, as indicated by the new Directives, of a more consistent use of recycled materials in the manufacturing of products.