2021
SUSTAINABILITY REPORT

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The year we left behind us was, unfortunately, still marked by the health emergency. It was a year of changing. What did not change, however, are the values and the effort Ecopneus makes every day to guarantee an ever efficient and effective management of the End-of-Life Tyres it is responsible for.

Since 2011, it is a journey that has seen the companies of the chain constantly heading towards a market logic and exponentially increasing the quality of their processes and of the products leaving their plants. On the other hand, the market of recycled rubber is finally going back to its pre Covid-19 levels, following the ups and downs caused by these years marked by the pandemic.

Within this context, the role of Ecopneus has been to facilitate the companies in this process. Moreover, it has stimulated the companies that use granules and powders to study new applications for recycled rubber and to optimise the existing ones. In the Tyrefield sports surfaces, in the sector of road infrastructures, in industrial uses as well as in the Tyreplast compounds, 2021 brought some innovations and developments whose benefits can already be seen. We hope they will become even more important in the years to come.

As I usually say: "phantasy is the only limit to the uses of recycled rubber". I strongly believe this to be true. Today, we can say that our Country has all the elements that allow recycled rubber to be a full-fledged circular material and, thus, to promote an ever greater use of the same. This will allow to better manage the financial resources of the Public Administration and to contribute to the sustainability of infrastructures and of industrial processes, at the same time creating qualified jobs and development opportunities.

These elements make us look to the future with optimism. We aim at profiting from all the opportunities the economic recovery will offer us after the dark period of the health emergency. As always, Ecopneus is at the service of our Country, the environment and the whole complex chain of ELT management. We rigorously respect the mandate we were entrusted with by the Legislator and our Partners, working ethically and transparently for a concrete and sustainable closure of the recycling cycle of this precious material that is recycled rubber.

FEDERICO DOSSENA
General Manager of Ecopneus

The time has now come to consider sustainability as a central asset of our Country's industrial and economic policies. Our ecosystem demands it; the European and global policies point at it, and also the citizens are asking for it.

The work of Ecopneus heads towards this direction. It acts on the responsibility it was entrusted with by the Legislator and assures the collection and recovery of 100% – and more – of the End-of-Life tyres Ecopneus is responsible for. Indeed, 2021 saw an extraordinary collection performance: 120% compared with our legal target. However, our efforts do not end here.

Indeed, assuring the correct recycling of ELTs allows to close only half of the recovery cycle of this resource. The other half is represented by the effort of finding new markets of use for recycled rubber, confirming energy recovery only as a secondary option.

So far, all our efforts have headed towards this direction and the same can be said about the ones that will come in the future. Moreover, we intend opening new ways forward in sectors with great growth potential – such as the industrial use of recycled rubber or chemical recycling processes. In particular, the latter would allow to reintroduce a part of recycled rubber into the production cycle of new tyres.

Moreover, we strongly support the operators of the spare part market – a key factor in the ELT circular economy. Indeed, they contribute to the correct recovery of ELTs throughout the whole Italian territory, thus assuring them a new life.

We shall continue to contribute to the constant improving of the national ELT management system, being aware that, on our side, we have a strong chain, a careful and tested management system and the greatest desire to assure the maximum service to all generation points we serve.

Yesterday, just as today – and even more tomorrow - we are at the forefront for creating the circular economy of End-of-Life Tyres.

DANIELE DE AMBROGIO
President of Ecopneus

1 THE RESULTS OF ECOPNEUS

A CONCRETE CONTRIBUTION TO THE CIRCULAR ECONOMY.

Assuring the ***collection and recovery of 100% of End-of-Life Tyres*** generated by the replacement of tyres legally sold on the spare part market during the previous year. This is the objective of the management system of the End-of-Life Tyres in Italy. Set up in 2011, Ecopneus has quickly led our Country to becoming an example of best practices in Europe.

The constant efforts of Ecopneus have contributed to this result. Ecopneus is a non-profit consortium and is the main operator in the management of ELTs in Italy. It manages about 60% of the End-of-Life Tyres generated in our Country. This amounts to an average of ***200,000 tonnes of ELTs every year***. These tyres are carefully traced in every Region and in every Province – from large cities to towns; from small mountain villages to the smallest of islands.

The efforts of Ecopneus are not only limited to the collection and recovery of ELTs, but they go further. Indeed, Ecopneus aims at ***expanding the possibilities of use of recycled rubber***, industrially structuring the recycled rubber chain, and creating a concrete and sustainable closure of the recovery cycle of this extremely precious resource: End-of-Life Tyres.

THE VALUES OF ECOPNEUS.

From the European sustainability objectives, to the global challenges of ONU's Sustainable Objectives. In order to meet these ambitious goals, it is of utter importance to change direction and head towards a model that combines environmental, financial and social sustainability. Within this scope, Ecopneus is well aware that its role is to ***promote dynamics that may go beyond the sole collection and recovery of an end-of-life product***. Indeed, these dynamics may be able to trigger virtuous mechanisms, where sustainability becomes a strategic source of development and the main driver of companies' business choices. In its turn, this will lead to the creation of qualified jobs, supporting the activities of research and development aimed at an ever growing use of recycled rubber. It is a constant ethical and legal commitment towards the environment, the citizens, the companies of the chain and its stakeholders.

THE RESULTS OF ECOPNEUS 2011–2021.

INDEPENDENT IN-DEPTH ANALYSES AND RESEARCH ON HEALTH, ENVIRONMENT AND SAFETY.

CONSTANT DIALOGUE, DISCUSSION AND IN-DEPTH ANALYSIS WITH THE PA.

2,520,443
TONNES OF ELTs COLLECTED

CONTRIBUTION TO THE PROCESS OF TECHNICAL STANDARDS (UNI, CEN).

EDUCATION AND INFORMATION (SCHOOLS, CITIZENS, WEB, SOCIAL MEDIA).

IN WHICH ***172,326 TONNES OF ELTs COLLECTED EXTRA TARGET***

15 HISTORICAL STOCKS WERE EMPTIED
THERE INCLUDED THE LARGEST STOCKPILE OF ELTS IN ITALY

EXTRA-ORDINARY INTERVENTION IN THE TERRA DEI FUOCHI:
87,418t

RECOVERY OF MATERIAL / ENERGY FROM 30/70% TO 53/47%*

SPORTS SURFACES

COMPOUNDS

ASPHALTS

INSULATION

INDUSTRIAL USE

ENERGY

*2011–2021 avarage value

2 THE ECOPNEUS SYSTEM

THE ECOPNEUS SYSTEM.

Every year, about 380,000 tonnes of ELTs are managed in Italy. This amount is equal to the weight of over 42 million automobile tyres. They are removed from automobiles, motorbikes, trucks and large means of transport for quarries and agriculture. Ecopneus is responsible for the tracing, collection and recovery of an amount of tyres equivalent to the ones sold on the spare part market by its partners during the previous solar year, minus a 5% weight loss caused by tyre wear and exports. Compared with an average annual collection of about 200,000 tonnes of ELTs, the ***legal collection target for Ecopneus was of 167,118 tonnes of ELTs*** in 2021. This amount resulted from the recalculation of the legal target as per DL n. 40 of 2020. Due to the consequences of the health emergency also on transports and business activities such as tyre dealers, the DL n. 40 of 2020 based the ELT management objectives on the 2020–2021 two-year period.

In 2021, the ordinary collection of Ecopneus was equal to 200,491 tonnes of ELTs. This marked an extraordinary performance that is more ***that 20 percentage points above its legal target***. This result was made possible also to the daily work of a network of 100 qualified selected companies located all over the national territory.

200,000
TONNES/YEAR OF ELTs MANAGED BY ECOPNEUS AS AN AVARAGE

20,030
AUTHORISED ELT GENERATION POINTS SERVED ALL OVER ITALY

Tyre dealers, workshops, service stations, large fleets.

COLLECTION
from the part of authorised companies.

STORAGE
in specialised centres.

SHREDDING PLANTS
For ELT treatment.

GRANULES
Football pitches, sports surfaces, playgrounds, acoustic insulation.

POWDERS
Asphalts, sealants, items made with rubber.

SHREDS
Electricity, cement, large civil works of ELTs.

THE LEGISLATIVE SCENARIO.

ART. 228 OF D.L. 152/2006.

Tyre producers and importers are to provide for the management of an amount of ELTs equal to the quantitative of tyres sold on the spare part market during the previous year – net of a 5% weight reduction caused by tyre wear and exports. This procedure complies with the Extended Producer Responsibility (EPR). The EPS is an organisational model sponsored by the European Commission and applied by the vast majority of the EU member states.

DECREE 182/2019.

Published in the Official Gazette on 8th April and effective from 23rd April 2020, this Decree improved and replaced the MD 82/2011. It updated some aspects that had been pointed out as legislative areas that would need to be improved. The Decree became operative from 1st January 2021 and its main news concern:

- **Regulation of online tyre sales from abroad directly to Italian consumers (B2C from abroad)** that have greatly grown in the last decade.
- Better definition of the subjects that can take on responsibilities in a consortium – both as founding members and as partners.
- Greater care in defining the obligations of the authorised subjects covering all national territory with their services and all ELT typologies. Similar quotas per geographical areas, tyre collection following the sequence of collection requests and without any links to sales brands and activities, assuring the **total separation of tyre sales and ELT management**.
- Fairer and clearer **identification of all the "individual" subjects that operate in the national system of ELT management**.
- **Greater, more complex and more precise reporting** to increase transparency towards the many involved stakeholders.

THE LEGAL TARGET FOR 2021.

During the *annus horribilis* of the Covid-19 pandemic outbreak, imagining the difficulties the sector of end-of-life tyres would face, the legislator introduced a waiver to the reaching of the target for the operators' annual management by approving Law n. 40/2020. Art. 4-ter of this law states: *"In the light of the emergency situation deriving from the COVID-19 pandemic and of the measures adopted to limit it affecting business activities and people's movements, the objectives of management of amounts of end-of-life tyres on an annual basis [...] have been parametrized to the 2020-2021 two-year period for the current year. As a consequence, the verification of the amounts of end-of-life tyres managed by the bodies in charge shall be made by counting the tyres placed on the spare part market in the 2019-2020 two-year period"*. For the first time in its history, in 2020, Ecopneus was not able to reach its yearly management target. For Ecopneus, the effects of the Law 40/2020 on the 2021 target resulted in an additional 6,933 tonnes of ELTs to collect on top of the amounts calculated as per MD 182/2019 for a total of 167,118 tonnes of ELTs (160,185 + 6,933 t).

FOCUS: THE ISSUES STILL TO BE RESOLVED IN THE ELT REGULATION.

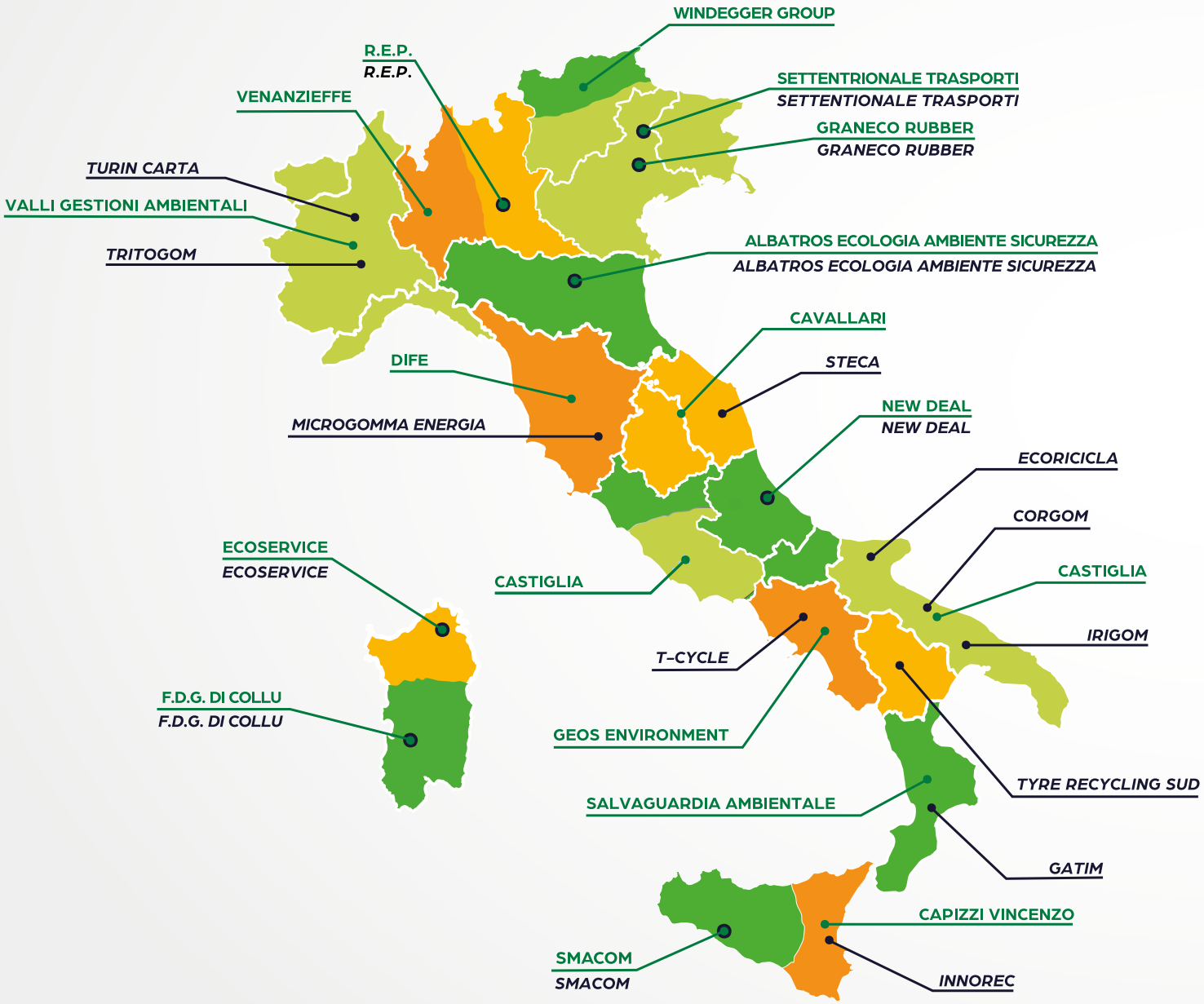
To face the year-old problem of the management of ELTs generated by illegal activities – estimated at about 40 thousand tonnes every year – in December 2020 the General Management for the Circular Economy of the Ministry of the Ecological Transition issued the Directive n. 0103883. It is aimed at all collective and individual systems of ELT management with an input above 200t/year. The Directive told these collection bodies to manage an extra +15% (up to a maximum of + 20%) of ELTs compared with the targets set by DM 182/2019. It also provided for the possibility of a recalculation of the eco-fees taking into consideration the related extra costs they would incur.

Among the motivations that led the Management of the Ministry of the Ecological Transition to take this decision, the same directive makes clear reference to the persisting collection criticalities that have been reported by many tyre dealers. It is stated how the causes of this issue are ascribable *"also to the modalities for the processing of the collection requests adopted by some authorised ELT-management bodies [...] and to problems in the acceptance of collection requests that are often justified – incorrectly in our opinion – by the reaching of objectives arbitrarily set by the same authorised management bodies"*.

With reference to this issue, the Directive highlights the persistence of opportunistic behaviour that violates article 3 par 6 of MD 182/2019 on the obligation the management bodies have to act on the collection requests respecting the tyre dealers' call order, as well as the articles that make reference to the collection obligations all over the national territory. The fact that this situation has persisted for years imposes a reflection on the necessity of revising the current legislative scenario. Indeed, the latter has allowed the proliferation of management forms that damage the efficiency of the system in its entirety. As of today, 8 collective management systems and 36 individual ones have been recorded, out of which 12 declare amounts of items placed on the market above 200 t/year. By way of example, a solution to this problem may be the evaluation of coordinated modalities of management and distribution of the intervention requests made by tyre dealers. The introduction of a minimum dimensional threshold for the associated bodies complying with the Extended Producer Responsibility can also be taken into consideration.

THE NETWORK OF PARTNERS.

AS OF 1/1/2022



KEY:

- COLLECTION COMPANIES
- *SHREDDERS GRANULATORS*
- COLLECTION *& SHREDDING* COMPANIES

THE RESULTS FOR 2021.

65,508
Collection requests complied with by the collection companies.

20,030
ELTGPs served (tyre dealers, workshops, service stations, body shops, farms).

418t
Protocol for the Terra dei Fuochi.

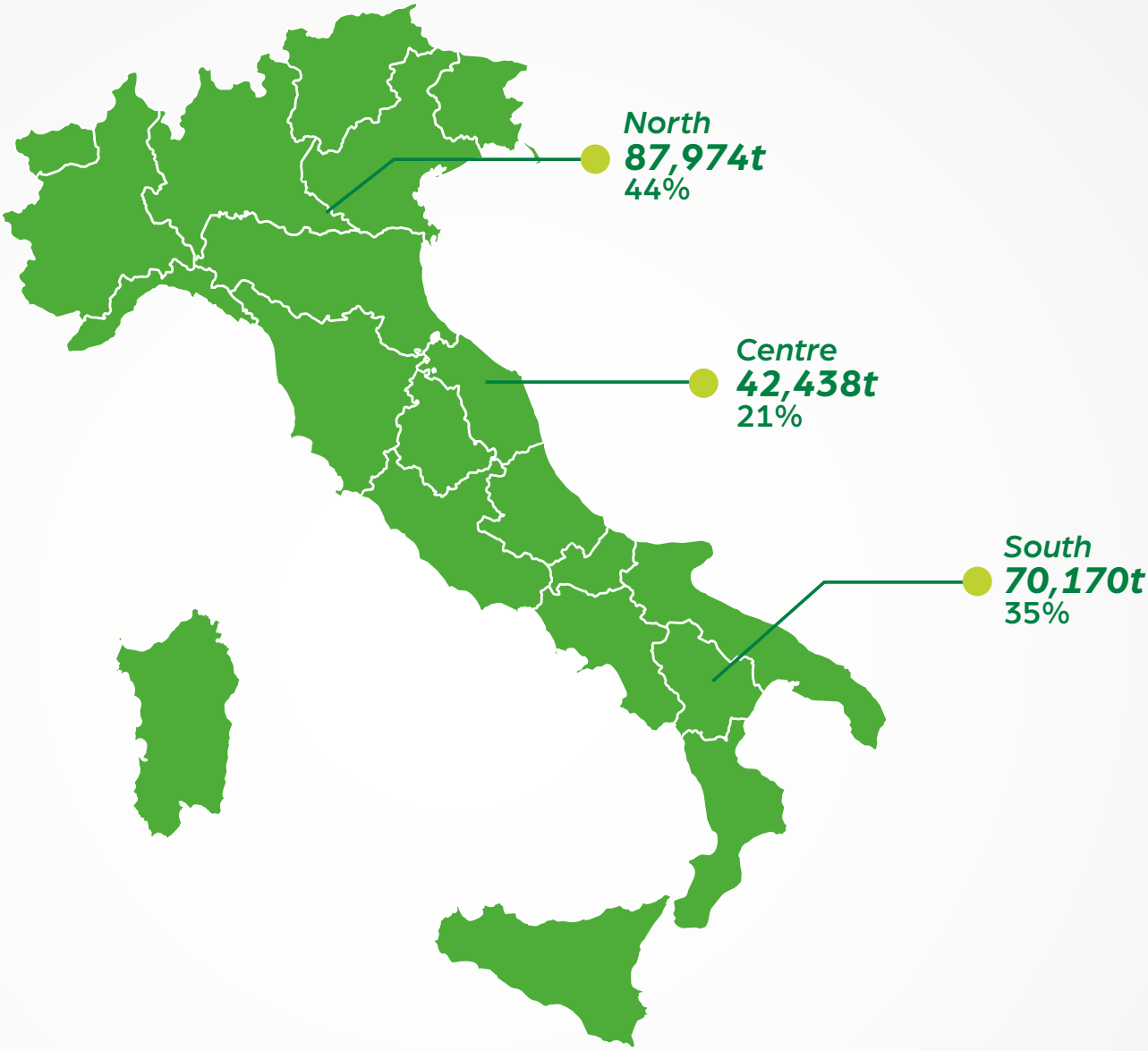
200,491t
Collection from ordinary management.

200,696t
Sent to recovery.

2021 HIGHLIGHTS

+20%
compared with the legal target set for Ecopneus.

ELT COLECTION.



BENEFITS.

ENVIRONMENT

310,000 tCO_2eq
avoided

1,23 million m^3
of saved water

282,000 t
of unused rosources

FINANCE

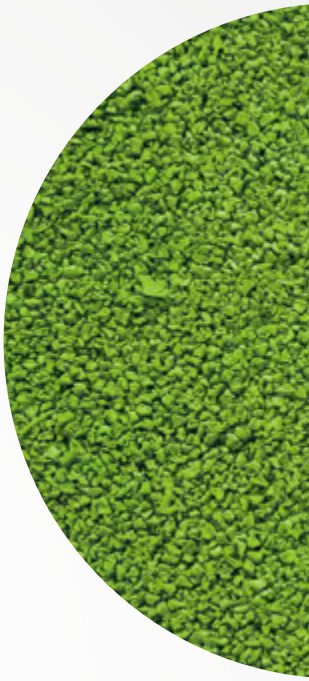
€ 79 million
saved on national imports of raw materials

ELT REGIONAL COLLECTION.

TOTAL
200,491t

ABRUZZO	**5,051**
Chieti	2,207
L'Aquila	1,100
Pescara	919
Teramo	824
BASILICATA	**2,815**
Matera	817
Potenza	1,998
CALABRIA	**8,107**
Catanzaro	1,120
Cosenza	3,056
Crotone	1,049
Reggio Calabria	2,417
Vibo Valentia	465
CAMPANIA	**17,951**
Avellino	1,830
Benevento	1,336
Caserta	3,121
Napoli	7,740
Salerno	3,924
EMILIA R.	**17,013**
Bologna	3,195
Ferrara	920
Forlì-Cesena	743
Modena	3,556
Parma	2,372
Piacenza	1,224
Ravenna	863
Reggio Emilia	2,871
Rimini	1,269
FRIULI V. G.	**2,682**
Gorizia	409
Pordenone	874
Trieste	431
Udine	969
LAZIO	**18,944**
Frosinone	2,632
Latina	2,565
Rieti	715
Roma	12,120
Viterbo	912
LIGURIA	**3,808**
Genova	1,898
Imperia	735
La Spezia	622
Savona	553
LOMBARDIA	**30,147**
Bergamo	3,236
Brescia	3,378
Como	2,081
Cremona	954
Lecco	1,082
Lodi	761
Mantova	1,119
Milano	8,518
Monza e Brianza	2,521
Pavia	1,589
Sondrio	948
Varese	3,960
MARCHE	**7,230**
Ancona	2,008
Ascoli Piceno	916
Fermo	934
Macerata	1,494
Pesaro e Urbino	1,878
MOLISE	**1,623**
Campobasso	1,146
Isernia	477
PIEMONTE	**9,803**
Alessandria	1,393
Asti	368
Biella	548
Cuneo	2,032
Novara	809
Torino	3,382
Verbano-Cusio -Ossola	640
Vercelli	632
PUGLIA	**11,776**
Bari	3,254
Barletta-Andria -Trani	1,181
Brindisi	1,161
Foggia	2,636
Lecce	2,260
Taranto	1,283
SARDEGNA	**8,504**
Cagliari	2,121
Nuoro	1,705
Oristano	563
Sassari	1,947
Sud Sardegna	2,168
SICILIA	**14,343**
Agrigento	1,413
Caltanissetta	813
Catania	2,987
Enna	797
Messina	1,822
Palermo	1,602
Ragusa	1,408
Siracusa	1,638
Trapani	1,865
TOSCANA	**12,628**
Arezzo	1,530
Firenze	3,061
Grosseto	1,305
Livorno	955
Lucca	1,338
Massa-Carrara	828
Pisa	506
Pistoia	1,178
Prato	670
Siena	1,257
TRENTINO ALTO ADIGE	**6,217**
Bolzano	2,093
Trento	4,124
UMBRIA	**3,546**
Perugia	2,491
Terni	1,055
VALLE D'AOSTA	**408**
Aosta	408
VENETO	**17,896**
Belluno	622
Padova	3,706
Rovigo	847
Treviso	2,870
Venezia	2,196
Verona	3,868
Vicenza	3,786

ELT TREATMENT AND EFFECTIVE RECOVERY IN 2021.



194,893t

TOTAL SENT FOR FINAL RECOVERY*

MATERIAL:

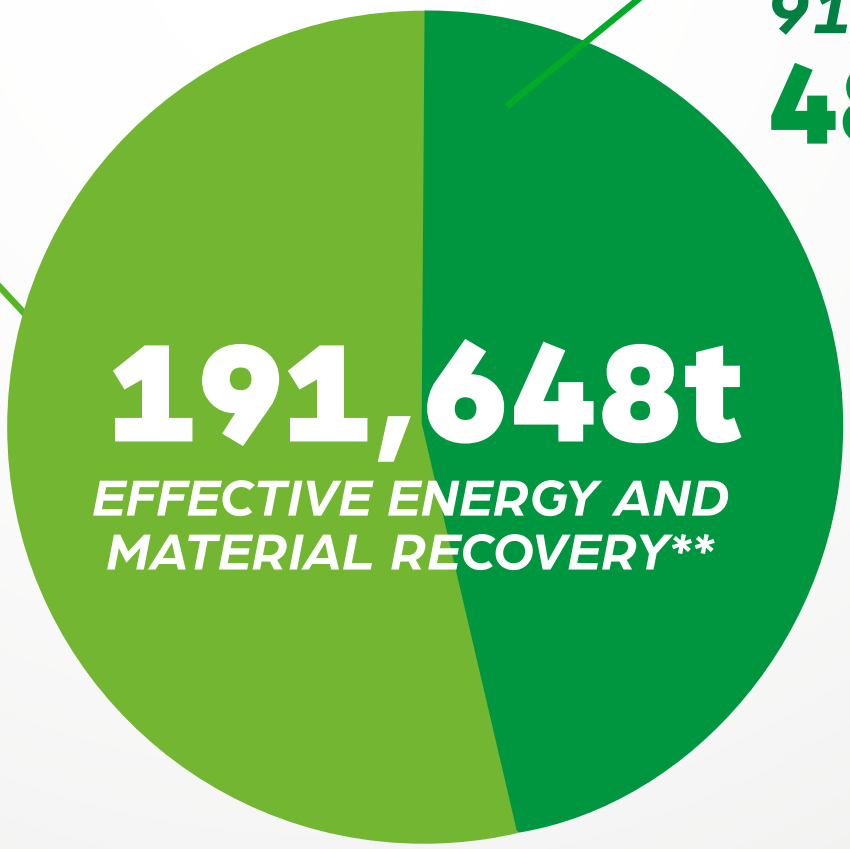
91,146t

48%

ENERGY:

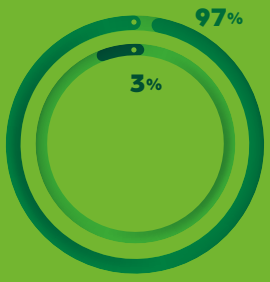
100,502t

52%

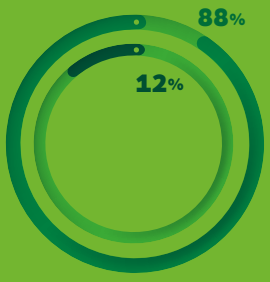


**The amounts of recovered ELTs (200,696 t) differ from the ones sent to the plants (194,893 t) due to the variation of the stocks between the beginning and end of business year.*
***The difference compared with the amount sent for final recovery is due to the ELT combustion residues sent for energy recovery in electrical power stations (estimate).*

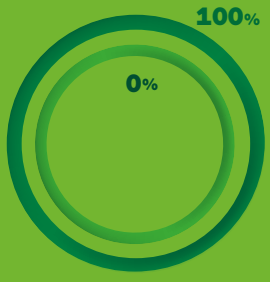
DETAIL OF EFFECTIVE MATERIAL AND ENERGY RECOVERY.



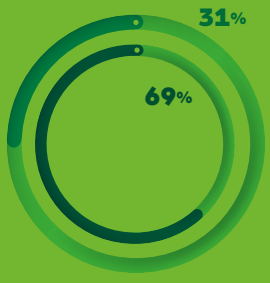
RUBBER GRANULES AND POWDERS
50,324t



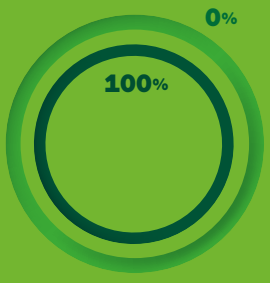
STEEL
15,842t



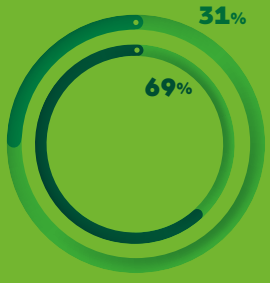
WHOLE ELTS IN ENGINEERING WORKS
69t



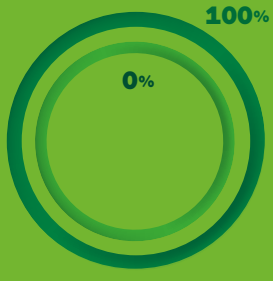
COMBUSTION RESIDUES OF ELTS SENT FOR ENERGY RECOVERY
24,234t



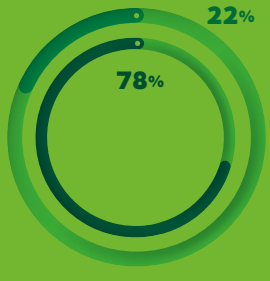
CARBON BLACK FROM PYROLYSIS
677t



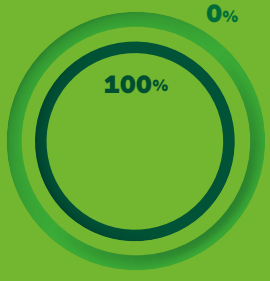
FUEL FOR CEMENT PRODUCTION
77,208t



FUEL FOR ENERGY PRODUCTION
10,276t



TEXTILE FIBERS RECOVERED AS FUEL IN CEMENT FACTORIES
12,002t



OIL AND SYNGAS FROM PYROLYSIS
1,016

THE MATERIAL RECOVERY:
carried out in Italy amounts to
77%

THE ENERGY RECOVERY:
carried out in Italy amounts to
36%

3 RECYCLED RUBBER

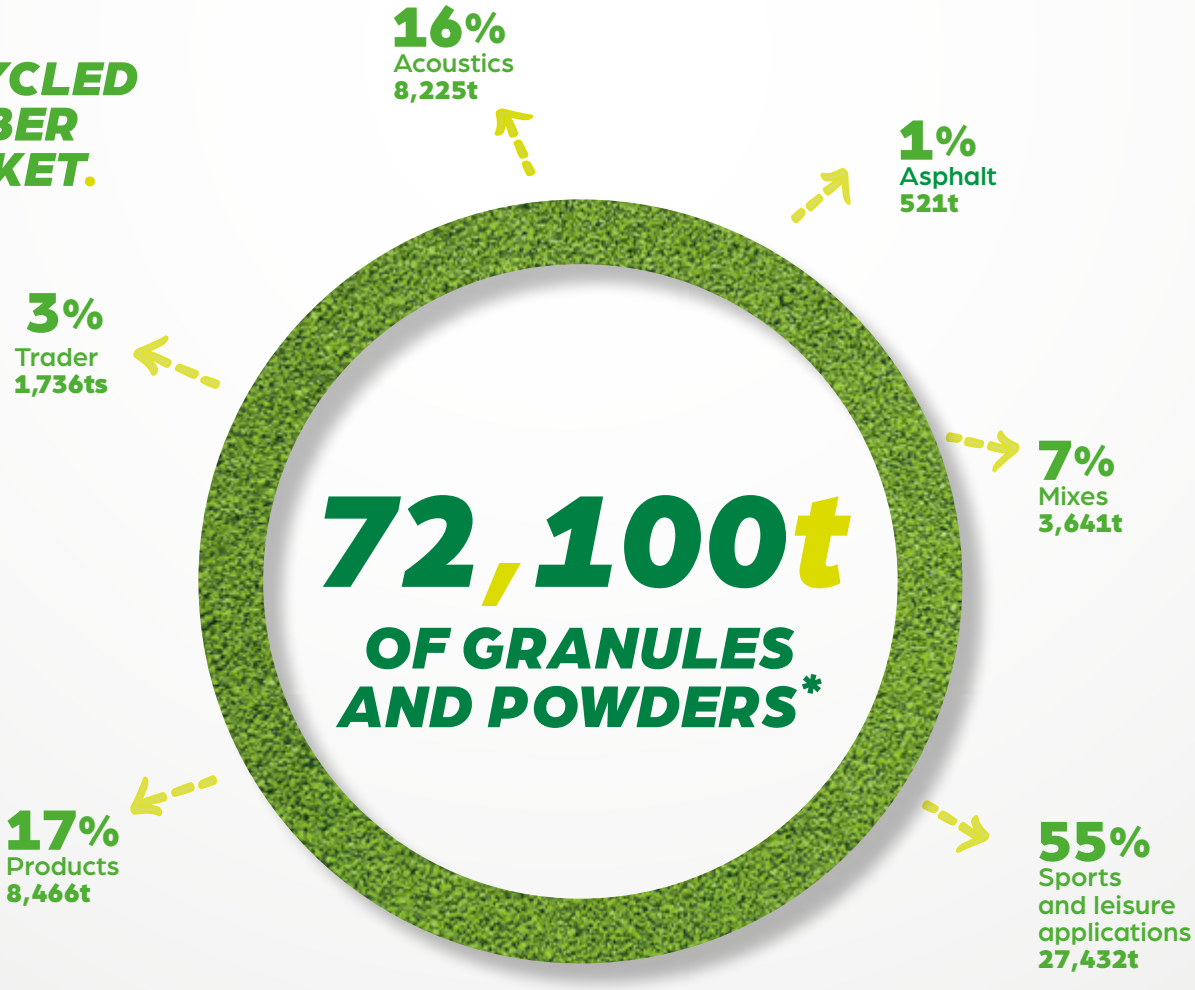
RECYCLED RUBBER FROM ELTs.

Recycled rubber from ELTs preserves those characteristics of elasticity and resistance that turn tyres into exceptionally performing objects. Nowadays, there are ***many varied applications that valorise the excellent characteristics of this material*** and the added value it offers. Indeed, ready and widely tested applications of recycled rubber are already at our disposal but are still not widely used in Italy. This makes it impossible to absorb all the recycled rubber that would be possible to obtain from all the recovered ELTs.

A clear example are asphalts modified with recycled rubber powders. They last for up to three times longer than conventional asphalts; they reduce the noise of the passing vehicles and offer greater safety thanks to the absence of potholes and cracks on their surface. However, they still struggle to penetrate the Italian market.

Here–below is an overview of the applications of granules and powders produced by the Ecopneus chain.

THE RECYCLED RUBBER MARKET.

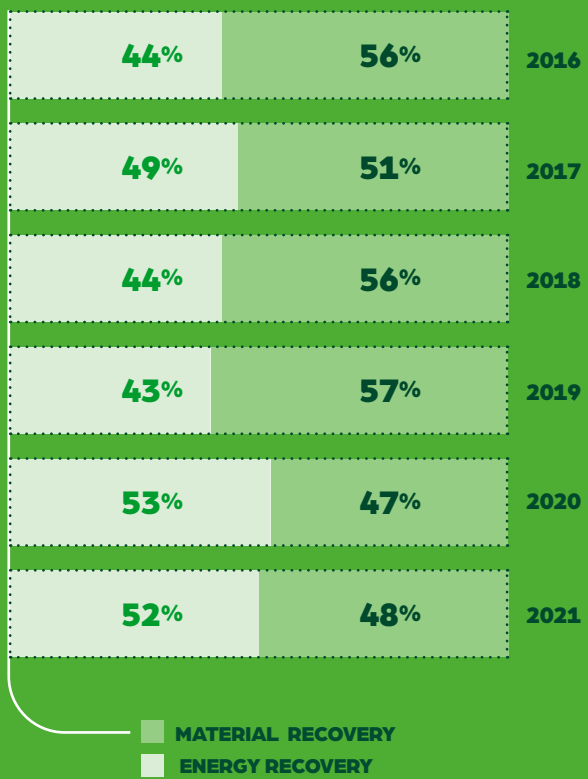


*Amounts of granules and powders from ELTs sold on the market in 2019 by the companies of the Ecopneus chain.

The effort of Ecopneus for the valorisation of recycled rubber makes reference to some underlying assumptions:

- Applying the EU ***hierarchy*** for waste management; prioritising material recovery and facilitating the preliminary phases of reuse and reconstruction;
- Supporting the consolidation and the development of the ***companies*** of the sector, in order to achieve an ever better ***quality of the material*** leaving the treatment plants;
- ***Promoting end markets*** for the available material, prioritising the national market and considering its export abroad only as a secondary option.

These aspects go beyond the sole waste management. They affect the whole chain. They promote new jobs, the creation of new markets and the development of the existing ones. They contribute to consolidating a segment of the circular economy that, in the long term, may be able to feed itself on a sole market logic. The efforts of Ecopneus have led to overturn the percentages of ELTs sent for material recovery compared with energy recovery – having the latter always had a historical advantage. However, this dynamic has suffered from the effects of the Covid-19 pandemic, when the market request for recycled rubber for products and applications contracted. After a reduction in the effective material recovery in 2020, 2021 saw a weak recovery – albeit still not in line with the performances of the previous years.



THE "END OF WASTE" M.D. FOR VULCANISED RUBBER.

The Decree of the Ministry of the Ecological Transition n. 78/2020 constitutes an important step and impacts decisively on the recycled rubber market. Indeed, it clarifies the conditions and the characteristics that define recycled rubber as a material. Moreover, it overcomes potential uncertainties and differences of interpretation of local legislation, thanks to a national regulation.

Indeed, thanks to common points of reference, the recycling plants will have the certainly of how the recycled material they produce will be classified. At the same time, the companies that use rubber granules and powders can rely on a certification for every single batch of material that guarantees its quality, characteristics and safety. In detail, the following can be found among the main operative news introduced:

- ***Only non-contaminated ELTs are allowed*** and/or materials from tyre reconstruction (retreading);
- The plants are to adopt ***procedures for tyre verification and selection, as well as a washing system*** to remove all possible external contaminants (mud, gravel, etc.);
- The creation of ***sampling and analysis on the*** outgoing recycled ***material***;
- ***The Producer certification*** is to be placed on every production batch of recycled material. In the Decree, the material is now defined as ***"Granular Vulcanised Rubber"*** and not as recycled rubber anymore;
- Vulcanised rubber is to comply with certain ***technical criteria***, listed in Attachment 1 of the Decree;
- ***Granular Vulcanised Rubber (EoW)*** may be used exclusively in the applications listed in Attachment 2 of the Decree;

This Decree will most definitively contribute to stabilise the activities of the recycling companies and stimulate the development of new products and applications. In particular, the use of recycled rubber powders in bituminous conglomerates for the production of modified, "silent" and long-lasting asphalts.

THE BRANDS OF THE MAIN SECTORS OF APPLICATION.

Within the scope of the efforts made by Ecopneus to promote the applications of rubber recycled from End-of-Life Tyres, three brands have been developed. Their aim is to support the spreading of recycled rubber applications and highlight its main uses. They are a useful tool to support the work of communication and awareness-raising towards the Public Administration, the professionals of the sector and the overall public opinion.

TYREFIELD

It identifies the sports surfaces made with rubber recycled from End-of-Life Tyres. These surfaces are highly performing. They last for long and are easily adaptable to every sport and performance level – from professional use, to the local playground. A consolidated market that, however, could further grow and expand to sectors that are still not very developed. An example is horse riding and livestock farming, as it offers great advantages from the point of view of animals' wellbeing.

TYREPLAST

It identifies the innovative compounds born out of the mixing of rubber powders from ELTs with thermoplastic polymers. The rubber powder is appropriately mixed by the means of specific compatibilizers to transfer some typical characteristics of rubber to the polymeric matrix. This procedure allows to boost and modify the functional characteristics of polymers. These materials are used in the automotive, building, sports, and livestock farming sectors, as well as in urban furniture and road infrastructures.

TYREFUEL

It deals with the ELT recovery flows in the production of cement and electrical power both in Italy and, above all, abroad. The amounts of ELTs that cannot be destined to material recovery are destined to this market. Ecopneus pays equal attention to the quality and management sustainability of this application. In this case, ELTs represent a precious fuel that is destined to qualified and reliable plants. As such, it is necessarily characterised by high quality standards.

RECYCLED RUBBER IN SPORTS.

FOOTBALL.

ELT-derived granules are used in synthetic turf sports surfaces as infill material for the grass blades. It is also used to create the layer underneath the playing surface. It makes the surface elastic and facilitates energy restitution to the athletes. At the same time, it drains rainwater. The management costs of this typology of fields are 50% lower than natural turf pitches.

In partnership with Ecopneus, **Atalanta BC** has created a state-of-the-art synthetic turf pitch for its sports centre in Zingonia-Cesarano (Bergamo).

Bologna FC 1909 has chosen a synthetic turf football pitch with rubber and organic material infill for its sports centre in Casteldebole, Bologna. This pitch is also used for rehabilitation.

In partnership with Ecopneus, **Udinese Calcio**, has chosen the Tyrefield football pitches with recycled rubber for its sports centre and for the requalification of the sidelines of their Dacia Arena stadium.

BASKETBALL AND 3X3 BASKETBALL.

When it comes to sports surfaces for basketball, the mixes used are specifically designed to achieve an adequate shock absorption and an optimisation of the return of the elastic energy. This offers a perfect answer to the athletes' biomechanical needs, a reduction of muscular fatigue, a reduction of micro-shocks and an overall improvement of the sports performance. Their resistance to all weather conditions makes these surfaces the ideal solution even for outdoor courts and for the ones for 3x3 basketball. Born in the 1980s, 3x3 basketball has grown in popularity in the course of the years. It debuted as an Olympic discipline during the Tokyo 2021 games.

PADEL.

Also this fast-growing discipline can benefit from the advantages of the Tyrefield surfaces. By appropriately modulating the characteristics of the superficial layer of the court and thanks to the thickness and the peculiar physical properties of the under layer made with recycled rubber, it is possible to affect the surface reaction. This satisfies the vast majority of athletes', managers' and trainers' requests – even the most demanding ones. Moreover, a recent study carried out by the internationally renowned biomechanics expert, Professor Mauro Testa, and his Biomoove team has demonstrated how the Tyrefield surfaces for padel allow to reduce shocks and micro-shocks to muscles and articulations, thanks to its peculiar and specific surface composition. In addition to this, these courts reduce muscular fatigue, thanks to a better reaction to athletes' biomechanical needs.

ATHLETICS.

ELT-derived powders and granules are combined with polyurethane resins for the creation of athletics tracks. Thanks to an appropriate design, it is possible to obtain a surface with specific characteristics, which are specifically designed for various needs: from a more rigid surface appropriate for those who are looking for maximum sprint, to a basic package equipped with greater elasticity for training and cooling down phases. Ecopneus puts great effort in identifying sustainable and innovative sports surfaces, promoting research aimed at preserving athletes' health and preventing accidents even in the athletics sector.

EQUITATION.

Surfaces made with recycled rubber in horse riding centres and stables assure animals' comfort, safety and hygiene. Moreover, the use of recycled rubber instead of sand in outdoor training fields allows to drastically reduce dust dispersion in the air and its related risks for riders' and horses' health.

In collaboration with the Department of Veterinary Studies of the University of the Studies of Perugia and UISP (Italian Union Sports for everybody), Ecopneus is testing innovative surface solutions made with recycled rubber for outdoor training fields and for walkways in stables. Some interventions have already been carried out in two riding centres, in Orvieto (TR) and in Todi (PG); as well as in the Veterinary Military Centre of the Italian Army in Grosseto and in Palermo's "Lancieri d'Aosta" barracks.

SAILING AND WATER SPORTS.

he Tyrefield slabs made with ELT-derived recycled rubber are a highly performing material for the needs of those who work in the sailing and marine industry. They are a concrete answer to the needs of safety and protection expressed by the professionals of the sector as well as all those who are passionate about the sea. The Tyrefield surfaces can be used in all those areas where safety is needed: outdoor walkways, technical areas, and descents to the sea. They offer great boat protection during the phases of approaching hard surfaces, and high safety for people thanks to the grip these surfaces are equipped with. Indeed, the latter allows to reduce the possibility of slipping even in wet conditions.

PLAYGROUNDS.

Recycled rubber is an excellent material for the creation of playgrounds and anti-shock surfaces for children. Thanks to its properties, it amortises the consequences of accidental falls. Moreover, it is long lasting. This application is very popular in public parks. It has been tested also in "Leolandia"- a theme park in the province of Bergamo – where there are playgrounds dedicated to its young visitors made with this technology. Recycled rubber has been used in Rome's "Fulvio Bernardini" Sports Centre and in the National Centre for Sustainable Development, "Il Girasole", owned by Legambiente in the town of Rispescia (Grosseto). The latter is a real outdoor showroom of the many uses of ELT-derived recycled rubber.

AT TRENTO'S SPORTS FESTIVAL, PEOPLE PLAY ON RECYCLED RUBBER.

Dal 2018 Ecopneus è Sustainability Partner de Il Festival dello Sport di Trento, che ogni anno richiama migliaia di visitatori e appassionati per quattro giorni di incontri e sport con i più grandi campioni nazionali e internazionali di moltissime discipline. In questo contesto prestigioso di attenzione allo sport e alla sostenibilità delle infrastrutture sportive, Ecopneus porta le performance e i vantaggi delle pavimentazioni in gomma riciclata. Negli anni sono stati realizzati, in collaborazione con aziende del settore, campi da basket e basket 3x3, volley, calcio, padel e piste di atletica.

Inoltre, con il contributo di Giacomo "Gek" Galanda, ex capitano della nazionale italiana, medaglia d'oro europea a Parigi '99 e medaglia d'argento olimpica ad Atene 2004, testimonial dei campi Tyrefield per il basket, Ecopneus permette di sperimentare queste eccellenti pavimentazioni ai tantissimi visitatori, tra cui centinaia di ragazzi delle scuole locali che negli anni hanno partecipato al camp curato dal grande campione nazionale.

ISOLAMENTO ACUSTICO.

It is possible to obtain products for different uses of the building sector from recycled rubber. Thanks to the relevant characteristics of elasticity and shock absorption typical of rubber, the products for acoustic, noise and vibration insulation are of great importance. They are used for floor acoustic insulation, preventing noise diffusion among the floors of a building (the so-called "footfall noise"), as well as for insulation interventions between walls – thus avoiding the transmission of soundwaves between adjacent rooms. They are also used for the creation of anti-vibration bases for machinery and installations such as lifts, air-conditioning units, and boilers. These peculiar properties turn recycled rubber into a highly performing material. It is also competitive compared with other materials on the market, both for interventions on modern buildings and for renovation and requalification activities, such as the one carried out in Parma's "Toscanini" Auditorium.

At the "Arturo Toscanini"'s Musical Production Centre, an important acoustic requalification intervention was carried out in the Gavazzeni Room thanks to the collaboration among the Foundation that bears its same name, Ecopneus, Genesis, and the A+C Architecture Firm. The Gavazzeni room is the largest rehearsal room of the Toscanini Musical Centre. It is 400 m sq. by 5m in height. It was acoustically insulated thanks to the use of 960 m sq. of panels containing over 3,330 kg of rubber recycled from End-of-Life Tyres. This intervention was promoted also through the realisation of a dedicated video clip with the musicians of the Toscanini Philharmonic Orchestra and an interview with the then Superintendent of the Toscanini Foundation, Maestro Luigi Ferrari.

MODIFIED "SILENT" AND LONG-LASTING ASPHALTS.

Driving on a silent and safe road without potholes is every driver's dream. This dream has already become reality: over 670km of stretches of road have been resurfaced using bituminous conglomerates modified with rubber recycled from End-of-Life Tyres all over Italy.

By adding rubber powder to bitumen for asphalts, it is possible to obtain a road surface that allows:

- ***an average reduction of the noise*** generated by tyres in contact with the road surface of about 3/5 decibel;
- ***long duration of the surface and exceptional resistance to road wearing***, with international experiences demonstrating that the surfaces can last up to three times longer than traditional asphalt;
- ***greater surface resistance*** to the creation of cracks of all types. This implies lower maintenance interventions, with a reduction of the inconvenience caused by road works and their related costs;
- ***greater safety***, thanks to excellent adherence; water drainage with drastic reduction of the "splash and spray" effect in case of rain and improved visibility. A greater resistance to the creation of potholes and its subsequent reduction in the presence of road works increase citizens' comfort and reduces accidents and noise;

A solution that allows to comply with the national and European sustainability targets, assuring a highly performing road surface, and ***better management of the financial resources*** at the disposal of Management Bodies and the Public Administration. Even the Cassa Depositi e Prestiti has appreciated the technological and environmental value of modified asphalts by financing an intervention carried out in Robbio (PV) at the end of 2021, precisely because of the efficient management of resources this material offers.

In Italy, ***the use of this technology has consolidated in the course of time also thanks to the constant effort of Ecopneus***. On the one hand, Ecopneus has supported new interventions and monitoring campaigns. On the other hand, it has raised awareness and promoted the divulgation of technical information and scientific data about this important application of recycled rubber. Its work has led to the creation of a series of technical dossiers in collaboration with Universities and research centres. They can be found at www. ecopneus.it/riciclo-pfu/pneumatico-fuori-uso/asfalti-modificati. The objective of these dossiers is to scientifically deal with technical aspects, case histories, formulations and performances of the various typologies of modified asphalts.

Their aim is to favour the circulation of information and technical updates among all the subjects of the Italian asphalt chain, in order to lead to a large-scale application of this valid solution for the roads of our Country.

STRETCHES OF ROAD RESURFACED WITH ASPHALT MODIFIED WITH RUBBER POWDERS FROM ELTs.

TOTAL

673km

KM/LANE,
PER PROVINCE
(as of 31/12/2021)

RESEARCH AND NETWORKING.

THE COLLABORATION WITH THE ARME FORCES: A TEST FOR NEW FORMULATIONS.

Ecopneus and the various bodies of the Armed Forces involved in this project have shared their technical know-how and their specific competences to jointly analyse the performances and the ideal formulations of the various applications of recycled rubber.

THE EXPERIMENTATION ON THE ANAS ROAD NETWORK.

The results of a test started in July 2019 on the Anas road network have confirmed the importance of this technology for the acoustic improvement of road surfaces. From the tests, it has emerged that the use of technologies and eco-compatible materials currently represents the technical solution that better complies with the objectives of the reduction of the acoustic and environmental impact, assuring excellent performances at the same time.

THE EU NEREIDE PROJECT.

The Life-Nereide project is co-financed by the European Union. It aims at optimising acoustic benefits and reducing air pollution and the overall environmental impact with the use of road surfaces made with recycled rubber and asphalt millings. Ecopneus has been a partner of this project in collaboration with ARPA Tuscany, the Belgian Road Research Centre, the Institute of acoustics and sensoristics of the NRC "Orso Mario Corbino", Region Tuscany, and the University of Pisa that is the project co-ordinator.

www.nereideproject.eu

THE LIFE SNEAK PROJECT.

The main challenge of the SNEAK Project (Optimized Surfaces against NoisE And vibrations produced by tramway tracks and road traffic) is to reduce the noise caused by road traffic and the wheel/track contact of tramways that particularly affect densely populated urban areas. The project involves the city of Florence and provides for the creation of the surface of a stretch of road with low noise emissions made with recycled materials – such as powders from End-of-Life Tyres. Moreover, the use of sound-absorption panels made with recycled materials has been provided for. They are to be applied on trams to contribute to the reduction of noise pollution and the propagation of vibrations.

THE INTERNATIONAL RUBBERAP RESEARCH PROJECT.

The RubberRap project intends to supply scientific data linked to the use of recycled rubber for the creation of modified asphalts for the road sector. In particular, it aims at investigating scientific aspects, such as the recyclability of the millings from rubberised asphalts. Ecopneus is a partner of the project in collaboration with the University of the Studies of Palermo and the Gustave Eiffel University.

THE COMBINED RECOVERY OF ENERGY AND MATERIAL FROM ELTs IN CEMENT FACTORIES.

TYREFUEL®

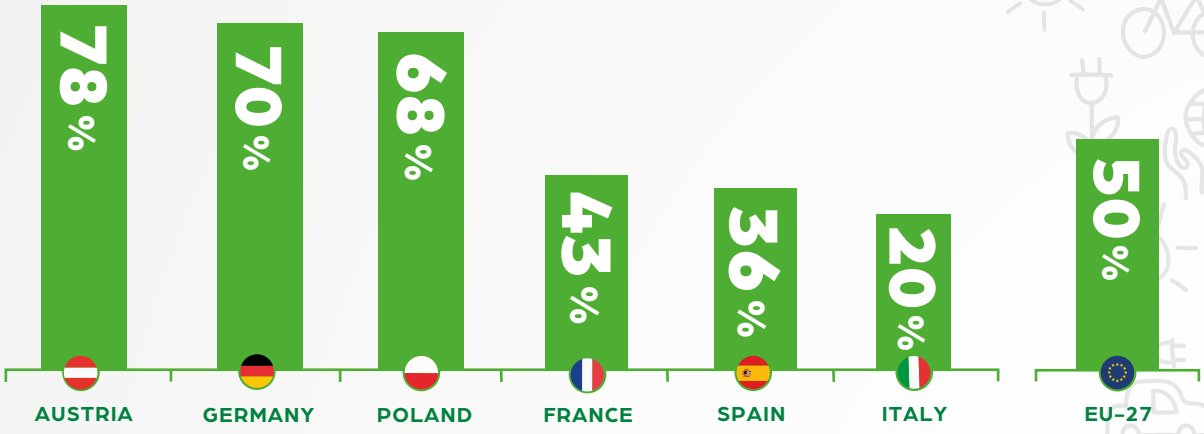
Ecopneus pays great attention to the consolidation and the development of the markets of the applications of recycled rubber and the subsequent increase of the share of ELTs recycled as material. Equal attention is paid to the preparation of ELTs as derived fuel for the production of energy – i.e.: TYREFUEL. Even the European Commission's Action Plan for the Circular Economy acknowledges that the recovery of waste energy potential is to be preferred, whenever it is not possible to prevent or recycle waste during the transition to a circular economy. Indeed, it is a key component to close the ELT recovery cycle in Italy, due to an internal market of recycled rubber that is still not mature enough to absorb all available material and to the legislative obstacles that do not favour its full development.

The energy recovery of ELTs is mainly carried out in cement factories. This allows to exploit the high calorific power of rubber – comparable to the one of pet coke – at its best. Moreover, it allows to recover ashes and steel as residual combustion materials. These are subsequently added to the end product, thus avoiding the use of virgin raw materials. This offers greater environmental and financial benefits for both companies and society. This combined process of energy and material is known as co-processing. Today, it is used throughout Europe significantly contributing to the competitiveness of the sector. Following a strong growth, from 1990 to 2020, the average rate of fuel replacement with alternative fuels in European plants went from 2% to 50%, with great differences from country to country *. In Austria and Germany, for example, the active plants recover over 70% of the produced thermal energy from alternative fuels. In Poland, the amount is about 67%; in France it concerns a little more than 40% of the total (a value that almost doubled in three years!). In Spain, it is 35%. Italy is at the bottom of this ranking with about 20% of replacement – a value that is well below the European average. The fuel derived from End-of-Life Tyres represents about 15% of the alternative fuels used by the European cement factories.

Federbeton, 2020 Sustainability Report.

QUOTA OF REPLACEMENT OF PROCESS THERMAL ENERGY WITH ALTERNATIVE FUELS IN EUROPE.

(2019 DATA)



Source: Federbeton, 2020

Notwithstanding the environmental advantages of recycling compared with any other form of energy recovery, a recent LCA study carried out by the Sustainable Development Foundation in collaboration with Enea* shows that the full replacement of fossil fuels (pet coke) with the ones derived from ELTs in the cement production process allows to avoid the release of 1 tonne of CO2 Equivalent into the atmosphere and the consumption of 210 kg of virgin raw materials – both mineral and fossil. Despite this double environmental and financial advantage from the point of view of the competitiveness of the sector, less than half of the ELTs generated in Italy that cannot be recycled as material are recovered as energy in cement factories on the Italian territory. The majority are sent abroad, thus moving an important share of value to countries and to chains competing with the Italian ones.

**"Environmental, financial and occupational impacts of alternative scenarios of ELT management in Italy" Sustainable Development Foundation, 2017.*

OPPORTUNITIES FOR THE RECOVERY OF MATERIAL FROM THE PYROLYSIS OF ELTS.

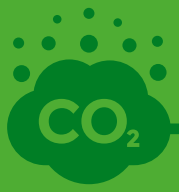
From a technical–scientific point of view, pyrolysis* is a thermochemical process that is carried out at controlled temperature and in the absence of oxygen. Pyrolysis causes the breaking of the chemical bonds of complex organic material (e.g. a polymer) into simpler hydrocarbons. Thus, pyrolysis provides for the transformation of materials into products that, in their turn, can be recovered as secondary raw material (recycling) or used as fuel for the production of energy (energy recovery). In general, the products of pyrolysis split into a volatile fraction (syngas), a liquid fraction (synoil) and a solid fraction (char). The standardised composition of ELTs allows an easy optimisation of the process parameters to optimise the recovery or important quantities of Carbon Black (CB) and of Tyre Derived Oil (TDO).

With further refining, it is possible to obtain recovered Carbon Black (rCB) from the Carbon Black derived from the process of pyrolysis. This product has the same characteristics that makes it suitable to be reused as a mix for the rubber and tyre industry – as also specified in the ASTM D8178 technical regulation. For what concerns the oil from pyrolysis, its chemical composition highlights a high concentration of aromatic hydrocarbons. Separated through fractional distillation, they can be used in the chemical industry for several productions, such as: solvents, plastics, bases for lubricating oils, but also phytosanitary and pharmaceutical products, as well as cosmetics. These opportunities attracted the interest of BASF. Indeed, in 2020, BASF extended the scope of its Chemcycling project for the chemical recycling of mixed plastics also to the oil from ELT pyrolysis. It announced new partnerships and agreements with European operators of the sector of ELT pyrolysis for the purchasing of TDO to be recovered in their plants. From an environmental and climate point of view, a recent study by the IVL – Swedish Environmental Research Institute – was carried out with a special plant equipped with a technology that allows the circulation of gas from pyrolysis in the reactor (Carbonization by Forced Convection, CFC). This study has shown that the production of rCB compared with its virgin production allows a saving on emissions per life cycle of up to 80%.

*As defined by the Framework Directive on waste 2008/98/EC, recently modified by the directive 2018/851/EU applied in Italy with the DL 305 of 3rd December 2010.

4 ENVIRONMENTAL BENEFITS

ENVIRONMENTAL BENEFITS.



CARBON FOOTPRINT

It is measured in kg of CO_2 equivalent. It represents the total quantity of greenhouse gases directly released during the life cycle of a product. The negative value associated to the activities of Ecopneus shows that the emissions avoided thanks to the recovery of material or energy from a product are greater than the ones produced by the activities linked to the analysed process.

BALANCE OF **AVOIDED EMISSIONS:**

–309,711 t CO_2eq

An amount equal to the one of 185,000 automobiles driving 10,000 km in a year.

MATERIAL FOOTPRINT

It represents the total flows of the mineral and fossil resources extracted for the production of a specific product or service during its life cycle. A negative value indicates that the positive impact linked to the resources that have not been extracted and consumed thanks to the recovery of material or energy during the life cycle of a product is higher than the negative one linked to the consumption of material necessary for the execution of the same activities.

BALANCE OF
SAVED RESOURCES:

–281,803 t OF MATERIALS

An amount equal to the weight of 575 high-speed Frecciarossa 1000 trains composed by eight carriages plus the locomotive.

WATER FOOTPRINT

It evaluates the water consumption linked to the net use of water resources and their pollution caused by the production of a specific product or service during its life cycle. A negative value indicates that the quantity of saved and non-contaminated water thanks to the recovery of material or energy during the life cycle of a product is greater than the one that has been consumed to feed the various analysed activities.

BALANCE OF
SAVED WATER:

–1,237,265 m^3 OF WATER

The quantity of water necessary to fill up 495 Olympic swimming pools.

5 FINANCIAL BENEFITS

FINANCIAL BENEFITS.

The activities of Ecopneus do not generate only environmental and social benefits, but also financial ones. In particular, Italy's savings on imports of virgin raw materials was of **79 million euros** in **2021** alone. This positive result was achieved thanks to the use of the materials obtained from the recycling of ELTs.

ESTIMATE OF THE SAVINGS ON THE TRADE BALANCE OF ELT RECOVERY.

Virgin material replaced by ELT recovery	2021 average price of raw materials (euro/t)	Savings from recovery in Italy (M/€)	%
Virgin Rubber (GVG recovery)*	1,748	70.9	89.5%
Iron scrap (steel recovery in steel factory)**	261	3.6	4.6%
Coke (recupero combustibili derivati da PFU)*	102	3.7	4.7%
Iron ore (recovery of steel in cement)*	136	1.0	1.3%
Total		79	

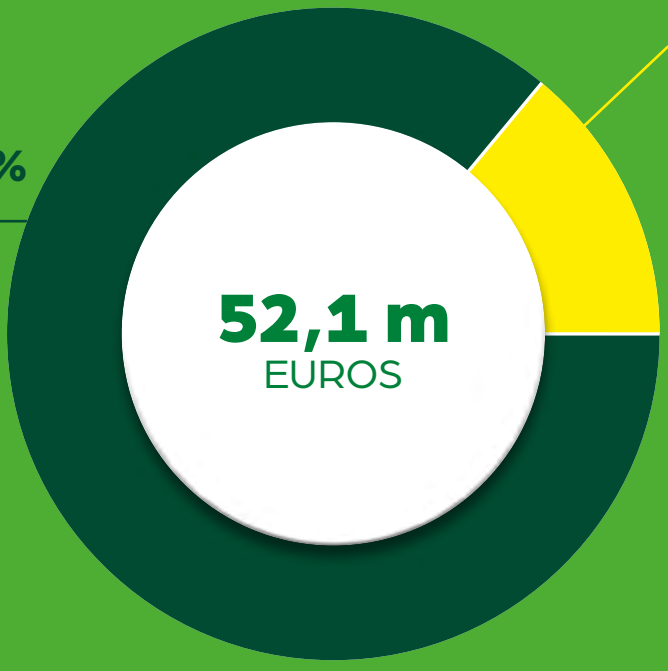
In **2021**, the financial value generated by the consortium fees amounted to **57.1 million euros**. The economic value distributed to cover all costs incurred for the functioning of the system was equal to **52.1 M€**. The largest amount of the economic distributed value – corresponding to **44.9 M€ (86% of the total)** concerned the costs incurred for the activities of collection, transport, treatment and recovery of ELTs. The remaining amount was spent to cover general costs. The main entries make reference to the costs of communication and of the many research projects promoted to support the chain and the market of recycled rubber as provided for by **art. 228 of D.L. 152/2006**.

*Source: World Bank;
** Source: www.letsrecycle.com

A THOROUGH AND EFFICIENT MANAGEMENT OF FINANCIAL RESOURCES.

The careful and thorough management of the financial resources from the part of Ecopneus contributes to the stability of the companies of the chain. Indeed, on top of being assured constant flows of materials to process, they can also rely on sure and regular payments. Its transparency in the use of such resources guarantees its compliance with the mandate entrusted by the legislator and the strictest interpretation of its own role as a non-profit body. The amount of the eco-fee is constantly checked and eventually modified in connection with a better system management, aiming at minimising consumers' expenditure

ECONOMIC DISTRIBUTED VALUE.



CHAIN COSTS 86%

Collection	48%
Transportation	13%
Shredding granules/powder	18%
Shredding shreds/chips	19%
Energy recovery gate fee paid to the plants	6%

14% GENERAL COSTS

60%	Projects, R&D and other Consultancy costs
34%	Communication
21%	Staff
6%	Taxes
0%	Capital

ECO-FEES.

The eco-fees applied by Ecopneus in 2021 followed the new scheme introduced with the MD 182/2019. This scheme now provides for **15 typologies of tyres** diversified by weight intervals. In their turn, they are grouped into **three categories: S=Small; M=Medium; L = Large**.
The new scheme does not allow for a direct comparison with the eco-fees applied in the previous years. However, it is possible to find some correspondences between the old and the new system with some approximation. For example, the fees applied to the tyre category identified as **"Motor vehicles and their related trailers"** until 2020: in 2021 they made reference to the typology from 2 to 4 of the S category (that is, tyres weighing from 5 to 15.999 kg). This segment represents the main flow of resources for the activities of the chain.
The noticeable increase in the eco-fees that can be seen in the graph here below was necessary to recover part of the savings for management risks. Indeed, the consortium used its savings in 2020 to avoid an increase in costs for the consumers during the difficult year of the pandemic.

PERFORMANCE OF THE ECO-FEES FOR "MOTOR VEHICLES AND RELATED TRAILERS" FROM 2011 TO 2021.

6 RESEARCH, QUALITY AND INNOVATION

RESEARCH, QUALITY AND INNOVATION.

Since the beginning of its activities, Ecopneus has paid ***great attention to the topics of research, quality, and innovation***. On the one hand, it has been collaborating with the companies of the chain following a path of progressive improvement of the quality of both processes and services. On the other hand, it has strengthened the several sectors of application of recycled rubber, creating new uses for the same. In particular, the work of Research & Development carried out in the course of the years has aimed at ***consolidating the scientific knowledge on the possible applications of recycled rubber***, both in those sectors that are already mature, and also in others with potential future growth.

This commitment takes advantage of the precious collaboration of a network of specialised and qualified partners that range from companies of the sector to universities and from Institutions to Research Bodies. Such approach allows for the involvement of the best collaborators for the reaching of the set targets, a strategic analysis, and the development of a green strategy with a wide and extremely qualified vision.

THE MAIN DEVELOPMENT PARTNERS:

THE MAIN AREAS OF RESEARCH AND INNOVATION OF ECOPNEUS:

- Participating in national and European technical roundtables (UNI, CEN, Etrma, CAM);
- Research and experimentation projects for the development of new industrial applications for recycled rubber (steel industry, sports installations, products, mixes and asphalts);
- Analysis and study of the technical specifications and regulations to effectively communicate and collaborate with the companies that use the recycled rubber from the Ecopneus chain.

TYREPLAST

FROM RECYCLED RUBBER TO COMPOUND.

Ecopneus and Idea Plast have given life to the Tyreplast project. It is aimed at developing innovative materials created from the ***combination of powders from ELT-derived rubber and*** (recycled) ***thermoplastic materials***, useful to give life to these innovative products. These compounds are used in many sectors. For example, in the automotive sector, they are used in the production of components and automobile finishing. In the building sector, they are useful for acoustic insulation and the damping of vibrations. Moreover, in livestock farming, it is possible to produce coverings and prostheses to protect animals from becoming lame. In urban finishing, instead, these compounds are used to produce benches and flower pots. The Tyreplast products are used also in the world of sports, for the creation of temporary or removable sports surfaces.

CHEMICAL RECYCLING.

Thanks to chemical recycling, it is possible to ***reintroduce secondary raw materials derived from End-of-Life Tyres in the industrial circuit***. These can contribute to the overall sustainability of both processes and processes. It is a sector with great growth potential in Italy thanks to the consolidation and the diffusion of state-of-the-art technologies. These materials may contribute to further increase the environmental and financial benefit offered by the recovery of End-of-Life Tyres for companies and society.

AT GENOA'S YACHT CLUB, THE TYREFIELD SLABS FOR THE NAUTICAL SECTOR.

Tyrefield slabs have been installed at Genoa's Italian Yacht Club – the oldest sailing club of the Mediterranean Sea. The slabs have been installed along the walkways, the 6x6 technical areas and the descents to the sea of this prestigious structure. This solution guarantees ***high boat protection*** and solves the problems of the boats when approaching hard surfaces. Moreover, it offers ***great protection for people***, reducing the risk of slipping in the areas near the water or in particularly wet environments.

RECYCLED RUBBER FOR THE DESIGN AND THE ARCHITECTURE OF OUR CITIES.

In collaboration with Milan's Foundation of the Order of the Architects, Ecopneus has promoted a free seminar to get to know the potentialities of rubber recycled from End-of-Life Tyres for the design and the architecture of our cities. A versatile, sustainable and innovative material, ***ideal to requalify urban spaces***.

THE INNOVATIVE TYREPLAST SLABS FOR BASKETBALL AT THE SPORTS FESTIVAL.

In 2021, a "semi-removable" court for 3x3 Basketball was created at Trento's Sports Festival, using the innovative Tyreplast slabs. The court has a double advantage: ***it fully satisfies athletes' needs*** and can be used also for temporary events.

7 SPECIAL PROJECTS

SPECIAL PROJECTS.

The efforts of Ecopneus are not only limited to the reaching (and exceeding) of the collection and recovery targets. It also aims at ***creating added value for our Country with reference to environmental protection and the circular economy***. This objective is carried out, in particular, with the many extra-ordinary projects Ecopneus has started on the Italian territory.

THE PROTOCOL FOR THE TERRA DEI FUOCHI.

Since 2013, Ecopneus has worked within the frame of a Protocol signed by the then Ministry of the Environment (nowadays: The Ministry of Ecological Transition), the Prefectures of the cities of Naples and Caserta, the Councils of Naples and Caserta and the Person in charge of the fight against arsons on that territory. Ecopneus has put extra-ordinary funding at the disposal of this project, organising interventions for the ***collection and management of the End-of-Life Tyres illegally disposed of on the territory of the Provinces of Naples and Caserta***. An extra-ordinary intervention aimed at contrasting the phenomenon of toxic arsons carried out by the means of the collection and recovery of the ELTs illegally disposed of on that territory. This project includes important projects aiming at informing and educating to legality, in order to fight off-the-books tyre sales that are linked to the illegal dumping of ELTs in the environment. Educational projects, initiatives organised in public squares, contests open to citizens, initiatives with schools to make culture and transform the ELTs removed from the territory into concrete symbols of environmental effort and protection. Clear examples are the synthetic turf football pitch of Scampia's stadium or the one of Caserta's Vanvitelli neighbourhood, where both children and teenagers train their legs and brain to legality.

THE FIGURES OF THE PROTOCOL FOR THE TERRA DEI FUOCHI.

- ***65 councils involved*** in the provinces of Naples and Caserta;
- ***Over 22,779 tonnes of ELTs collected***;
- ***Emptying of 3 historical stocks*** in Scisciano (NA), Naples and Villa Literno (CE);
- ***Over 1,000 students*** involved in training and environmental awareness raising activities ***every year***, from 2013 to 2018. These are training and awareness-raising activities on "environment and legality";
- ***Initiatives in public squares*** and contests for the citizens;
- Creation of a regulation-sized ***football pitch*** entitled to Antonio Landieri ***in Naples's Scampia neighbourhood***;
- ***Playground and multipurpose surface in Caivano's Parco Verde*** neighbourhood (NA);
- ***2 football pitches in recycled rubber*** created in ***Caserta's*** Vanvitelli neighbourhood;

SCAMPIA IS BORN AGAIN THANKS TO RECLYCLED RUBBER.

Creation of a regulation-sized football pitch dedicated to Antonio Landieri in Naples's Scampia neighbourhood.

EVERYBODY AT WORK FOR THE VANVITELLI NEIGHBOURHOOD.

Creation of an 11-a-side football pitch and a 5-a-side one in Caserta's Vanvitelli neighbourhood.

The operative activities of the Protocol are supported by the campaign "I choose the right way". This campaign appeals against the off-the-books purchasing of tyres, which has given rise to the phenomenon of illegal dumping of End-of-Life Tyres. These, then, reappear in the fields or on the side of streets and subsequently become fuel for the arsons that sadly identify this territory. The choice of accompanying the activities on the territory with an information and awareness raising campaign is linked to the objective of intervening with an immediate recovery as well as building long-lasting results. These aim at helping the younger generations to make responsible, legal choices for their future.

THE EMPTYING OF 15 HISTORICAL STOCK.

FROM THE NORTH TO THE SOUTH OF ITALY.

Up to 31st December 2018*, the DM82/2011 stated that the bodies in charge of ELT management, such as Ecopneus, had to allocate at least 30% of the end of year economic surplus – if available – for interventions of emptying and removal of "historical stocks". These are amounts of ELTs to be found in failed businesses, plants or the natural environment. They are linked to the lack of a national coordinated system for ELT collection and recovery up to 2011. With reference to these interventions, the activities of Ecopneus have concentrated in Region Campania, where 3 sites have been emptied within the scope of the special project for the Terra dei Fuochi. Among the various bodies responsible for the management of ELTs in Italy, Ecopneus has paid *great attention to the issue of emptying all large historical stocks in Italy*.

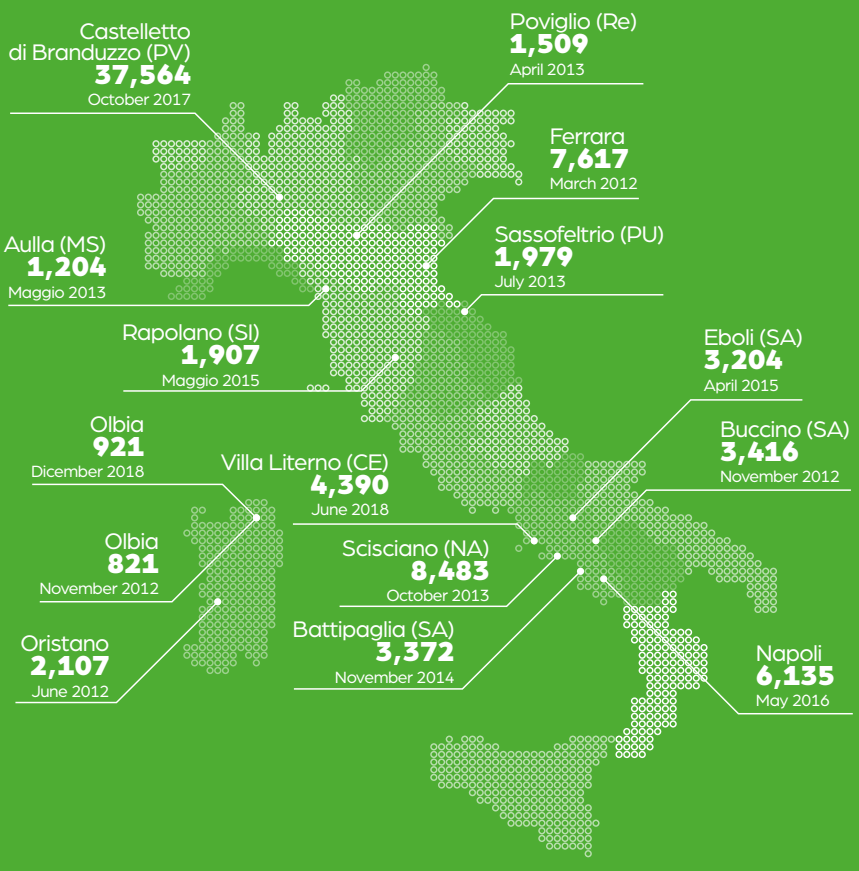
ECOPNEUS COLLECTIONS OF ELTS FROM HISTORICAL STOCKS

Data in tonnes

TOTAL
84,629t

FROM 2012 TO TODAY

- **15 historical stocks** have been emptied.
- Over **84,000 tonnes of ELTs** equal in weight to about **9.3 million** automobile **tyres**.
- A volume capable of filling over **80 Olympic swimming pools**.



* Art. 1, par 751, lett. b) of the Law 30th December 2018 n.145, the so-called "2019 Budget Law", modified the modalities of use of the economic surplus deriving from the eco-fees for the management of End-of-Life Tyres.

OBSERVATORY ON THE ILLEGAL FLOW OF TYRES AND ELTS IN ITALY.

Since 2016, Ecopneus has ***promoted a round table to discuss and find solutions to the issue of illegal tyre sales in Italy***. It is a phenomenon spread from the North to the South of the Country and has an important impact on the market. It puts the correct management of ELTs at risk, because the tyres sold on the black market are not counted in the national total. As such, they are excluded from the collection quotas attributed to the various operating bodies. The initiative has been supported by the main interlocutors of the tyre and ELT chain in Italy – a network of over 50,000 companies. Within the scope of this observatory, ***CambioPulito*** was launched in May 2017. This was the first whistleblowing platform promoted by the private sector that has seen such wide participation. It dealt with the collection of anonymous reports on incorrect or illegal behaviour among companies. In their turn, these generate unfair competition and the risk of illegal ELT dumping. At the end of 2019, the Observatory ended its investigations on this phenomenon even through the data collected by the CambioPulito platform. These data gave a clear picture of the dimension of the illegal flows of tyres and ELTs in our Country, as here reported:

30/40 thousand tonnes of tyres are estimated to be illegally sold every year.

The following is linked to these amounts:

- ***12 million euros*** is the estimated loss of eco-fees for ELT collection and recycling;
- ***80 million euros*** is the estimated amount of unpaid VAT;
- The ELTs coming from illegal activities are ***exposed to the risk of being dumped in the environment***;

361 reports on illegal activities were recorded on the CambioPulito platform (June 2017– 15th December 2019). They involved ***301 companies***.

The reports were processed by Legambiente by the means of its Lawyers of the Juridical Action Centres (Ceag). Almost all of them turned out to be precise, well-detailed and rich in supporting evidence. They resulted in ***8 reports*** sent to:

- Carabinieri for Environmental Protection. 136 companies were reported (126 Italian and 10 foreign companies); 35% of the operators subject to inspections were subsequently sanctioned;
- Autorità Garante del Mercato e della Concorrenza (the Italian Competition Authority). 14 internet sites were reported (5 Italian and 9 foreign sites);
- Naples' Operative Aeronaval Department of the Finance Police: 24 cases were reported in Region Campania alone.

About 80% of the reports involved supposed breaches of the rules on trade, free competition and labour market. Thanks to these reports, it was possible to focus on the dynamics of the increase of thefts of new tyres and their sale on the black market (especially online).

A FOOTBALL PITCH IN ROME'S CORVIALE NEIGHBOURHOOD.

The Società Sportiva Dilettantistica Calcio Sociale (Social Football Amateur Sports Association) and the Istituto per il Credito Sportivo (the Institute for Sports Credit) have completed an 11-a-side football pitch made with recycled rubber in the area Campo dei Miracoli, in Rome's Corviale Neighbourhhod. Ecopneus has been one of the supporters of this project that aims at implementing the aggregation activities of the young people and their families. It also aims at improving the opportunities for socialising at the disposal of the local community.

A CITY OF RECYCLED RUBBER AT FESTAMBIENTE.

Festambiente is the National Festival of Legambiente. It is held at Rispescia (GR) every year. Thanks to Ecopneus, a city of recycled rubber has been created for this Festival in the course of the years. It offers many innovative solutions for the enjoyment of young and old people alike. It offers basketball courts, football pitches, mini-golf courses, the TuttinGioco inclusive playground, the acoustic renovation of the Auditorium, cycle lanes, urban furniture, and relaxation areas – all of them made with rubber recycled from ELTs.

AN ATHLETICS TRACK MADE WITH RECYCLED RUBBER AT MODENA'S MILITARY ACADEMY.

Modena's Military Academy is the only institution of basic training for the Officers permanently on duty of the Italian Army and the Carabinieri corps. A new athletics track made with recycled rubber has been created on its premises.
Its surface has been made with the best available technologies and is able to combine athletics performances at the highest level, with a constantly growing sustainability of the Armed Forces' sports infrastructures.

FURNITURE AND MODIFIED ASPHALT AT CECCHIGNOLA'S VACCINAL CENTRE.

Urban furniture, bollards made with recycled rubber and a stretch of road made with asphalt modified with rubber powders from ELTs are the symbols of the collaboration between the Italian Army and Ecopneus. This collaboration carried on even during the pandemic period. This project falls within a framework agreement signed for the implementation of interventions and projects with the structures of the Armed Forces.

8 COMMUNICATION, EDUCATION, TRAINING

COMMUNICATION, EDUCATION, TRAINING.

The many activities carried out by Ecopneus within the scope of its competence are completed with the communication and awareness-raising activities that aim at informing all its stakeholders about the ***correct and transparent management of its activities at the service of citizens and for the promotion of the applications of recycled rubber***. Promoting a culture of recycling, ethics and legality for a correct management of waste and creating fertile ground for an constantly growing development of the various applications of rubber is a responsibility imposed through the MD 82/2011 and now with the new MD 182/2019.

THE TOPICS

The environmental and financial benefits of ELT recycling.

Promotion of the completed installations.

Correct management of ELTs in Italy.

Commitment to legality.

Support to the companies of the chain.

Energy recovery and industrial use.

Efficient and effective management of financial resources.

MEDIA
PUBLIC OPINION
COMPANIES OF THE CHAIN
SECTOR OF APPLICATIONS
ACADEMIC WORLD

PA
TECHNICAL CONTROL BODIES
LAW-ENFORCEMENT

DIGITAL COMMUNICATION.

The presence of Ecopneus on the internet and social media has grown in importance in the course of the years. In particular, it aims at ***intercepting and dialoguing with all the members of the public interested in the activities of Ecopneus***, answering to the community, offering information and updates in real time on its ongoing activities. The website www.ecopneus.it has always been a source of extensive and detailed information on the activities of Ecopneus and the promotion of recycled rubber. Over the years, it has naturally evolved, by way of example, with the introduction of an information "dashboard". Thanks to charts, maps and data, this dashboard allows to have a detailed picture of the activities of Ecopneus linked to ELT management in a simple and intuitive way. Even social networking has consolidated over the years creating a very loyal community that follows and interacts. Ecopneus places great care in informing and raising the awareness of this community about the applications of recycled rubber and the events Ecopneus takes part in. In 2021, the social ecosystem of Ecopneus further grew thanks to the setting up of its Instagram profile, which joined the already existing accounts on Facebook, Twitter, Linkedin and YouTube.

80,054 USERS
118,941 SESSIONS
202,930 VISITED PAGES

1,13 M
CONTENT VISUALISATION
989K USERS REACHED

291
TWEET AND RETWEETS
48,563 DISPLAYED CONTENTS

59 POSTS
96,066 DISPLAYED CONTENTS

192 POSTS & STORIES
96,606 DISPLAYED CONTENTS

41,913
VISUALIZATIONS
1,203 HOURS VIDEO/VIEWS

TRAINING, CIRCULAR ECONOMY AND END-OF-LIFE TYRES: THE ECOPNEUS ACADEMY.

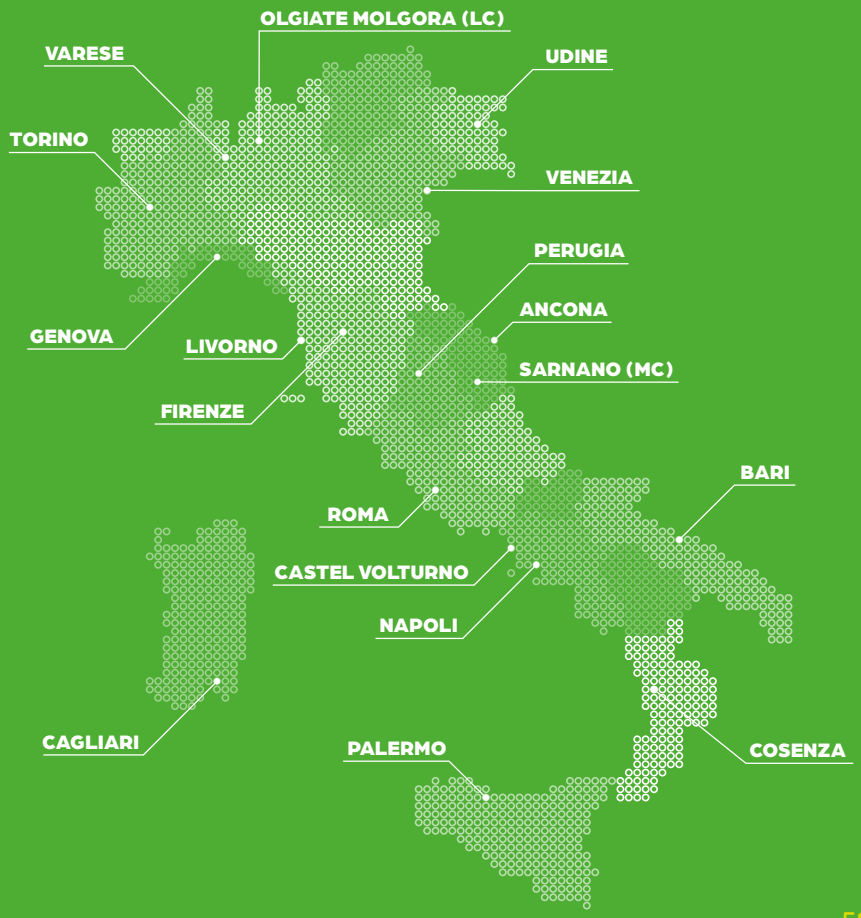
Founded in 2021, the Ecopneus Academy deals with high-level training on the topics linked to the circular economy of End-of-Life Tyres: from the correct management of their recycling to the legislation of reference, up to the sectors of application of recycled rubber. The ***Ecopneus Academy*** groups the many educational and training activities started by Ecopneus under a single name. Examples of these activities are the PFU Academy, the Educational Project and the new planned initiatives. Through the ***sharing of knowledge and innovative tools***, the Ecopneus Academy aims at constantly developing the ***culture of sustainability***, thus concretely contributing to Italy's sustainable growth and to a better knowledge of the dynamics of the sector.

LA PFU (ELT) ACADEMY.

It is a format of workshops about the regulatory and administrative background of ELT management organised in collaboration with experts of the sector. The PFU Academy has been set up in collaboration with Legambiente and is supported by ISPRA and the Regional ARPAs. The PFU Academy is aimed at the technical figures of Control Bodies and Institutions, the Law Enforcement authorities and the Public Administration. Since 2013, it has organised 18 events with over 1,600 participants and thousands of technical manuals and leaflets distributed all over Italy. Due to the Covid-19 Pandemic, the activities were suspended in 2020 and 2021. However, new appointments have already been planned for 2022 under the umbrella of the Ecopneus Academy.

ECOPNEUS ACADEMY | PFU ACADEMY

18 EVENTS
from 2013 to today



THE EDECATIONAL PROJECT IN SCHOOLS.

Since 2013, Ecopneus has organised a ***training project for the students of secondary schools*** in collaboration with Legambiente. As of today, it has involved over ***11,000 students in 10 Italian regions***, from the North to the South of the Peninsula. It is a project that aims at raising the awareness and help students to get to know and understand the benefits deriving from the correct management of ELTs. Every citizen can – and must – contribute to this task, choosing to legally purchase new tyres against off-the-books sales that feeds illegal ELT dumping. Every year, this project focuses on a different Italian region. It organises meetings with the students in their classrooms and visits to the plants that treat ELTs; it supplies educational materials, an event to better understand the concepts of legality and sustainability, and a contest. Every year, a jury composed of representatives of Legambiente, the Ministry of Instruction, the Ministry of the Ecological Transition and Ecopneus awards sports surfaces and objects made with recycled rubber to the schools of the winning classes. These prizes are permanent and important messages of legality and environmental protection in the places where the new generations are formed.

THE DONATIONS TO THE SCHOOLS MADE WITH THE EDUCATIONAL PROJECT OF ECOPNEUS

AN ONLINE EVENT TO CELEBRATE THE 10 YEARS OF ECOPNEUS.

June 2021 was the 10th anniversary of the setup of the ELT management system and of the activities of Ecopneus in Italy. Due to the restrictions necessary to limit the spreading of the Covid–19 pandemic, it was not possible to organise live events. As such, a virtual studio was organised in Rome. Some guests were physically present and alternated with a number of connections, both recorded and live, that were planned with the main institutional stakeholders, the PA, and the academic, political and entrepreneurial world. These accounts joined the celebrations for an excellence of the circular economy.

WINNING FIGURES AT THE SPORTS FESTIVAL!

Trento's Sports Festival is an incredible showcase for the sports applications of rubber recycled from ELTs. It is also one of the moments of greatest visibility for Ecopneus. In particular, in 2021, the Festival was at the heart of a communication plan dedicated both to the digital and the print press. In the 4 days of the event, there were over 6 million impressions of the Ecopneus contents on the Gazzetta dello Sport circuit. Over 600 thousand were the ones on the social media of Ecopneus; moreover, there were 7 thousand visualisations of the pages dedicated to the sports surfaces made with recycled rubber on the Ecopneus website.

THE FIGHT AGAINST ILLEGALITY IN THE SHOW OF RAI 3 REPORT.

"Terra Felix" was the name given to the report on the management of waste in the Terra dei Fuochi by Bernardo Iovene. It was broadcast on Rai 3 during "Report" – a TV show – in May 2021. The chain of End–of–Life Tyres was one of the ones described also through the interview to the General Manager of Ecopneus and the evidence of the companies of the chain. The constant work of Ecopneus to create a culture of recycling and legality in favour of honest and environmental operators is strengthened from moments of visibility and awareness–raising such as these.

SAILING TO FIND OUT ABOUT THE ADVANTAGES OF RECYCLED RUBBER.

Ecopneus has been the Sustainability Partner of the Marina Militare Nastro Rosa Tour. This is a tour of Italy on sailing boats that reached 8 among the most beautiful Italian coastal towns between August and September. At every stop there was a regatta village, where visitors, the Public Institutions and the professionals of the sector were able to find out about the innovative Tyrefield surfaces in recycled rubber specifically designed for the nautical sector that turned this amazing event into an example of sustainability.

CAVALLI ON LIVE: THE APPOINTMENTS DEDICATED TO HORSES' WELLBEING .

Scientific research, sport, animal wellbeing and circular economy were the topics at the heart of Cavalli On Live, the online format dedicated to horses' and riders' wellbeing. Over 20 meetings were organised from May to November 2021. In spite of the Covid-19 pandemic that did not allow to organise live events, Ecopneus nevertheless carried on with its activities of information on the many applications made with recycled rubber for horses' wellbeing, intercepting a public of professionals, veterinaries, specialists and equitation lovers with innovative modalities. The appointment was organised by Ecopneus and UISP – Italian Union Sports for Everybody – in collaboration with Fieracavalli.

PARTNERS OF ECOPNEUS

AS OF 31/12/2021

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BRIDGESTONE EUROPE
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CATANIA GOMME
CONTINENTAL ITALIA
D.P. COMMERCIAL TYRES
DAST
DEVALLE GOMME
DRIVER ITALIA
DRIVER SERVIZI RETAIL
DROPMOTIVE
DST
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EUROREIFEN MS
FCA ITALY
GEXPO
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GOTTARDI
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IDIO RIDOLFI E FIGLI
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MARANGONI INDUSTRIAL TYRES
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TARGETROBOT
TYRE TEAM
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SUSTAINABLE DEVELOPMENT FOUNDATION

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