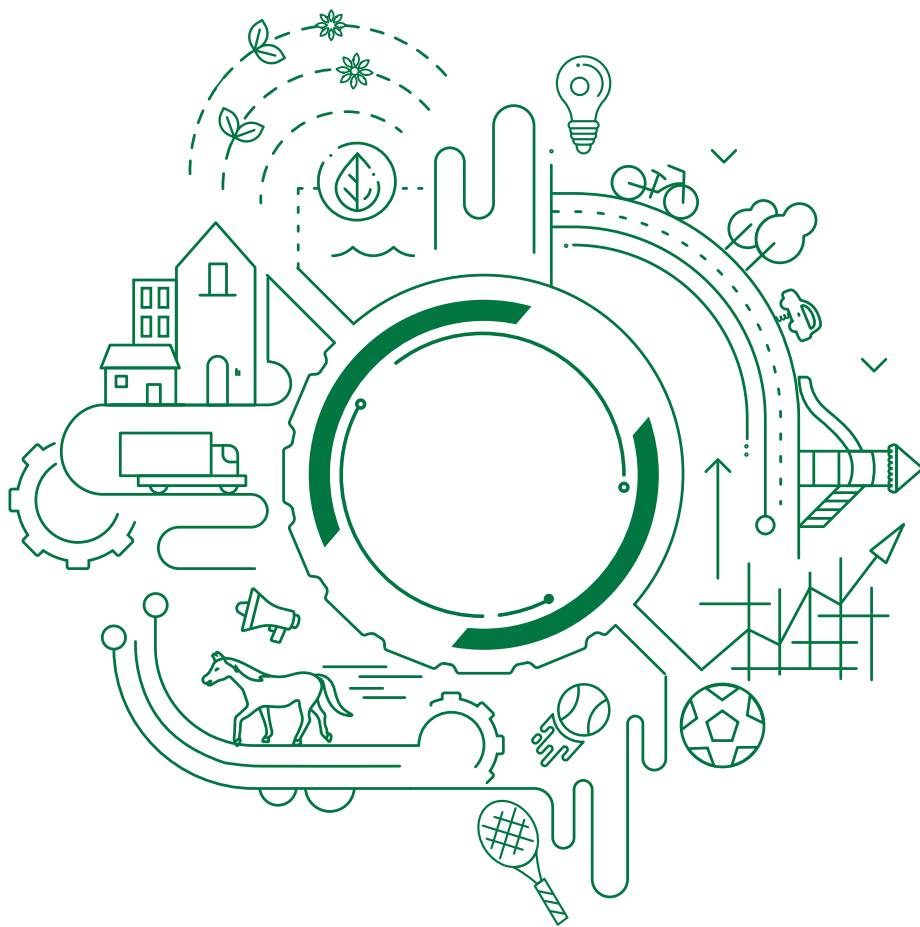




# REPORT 2018







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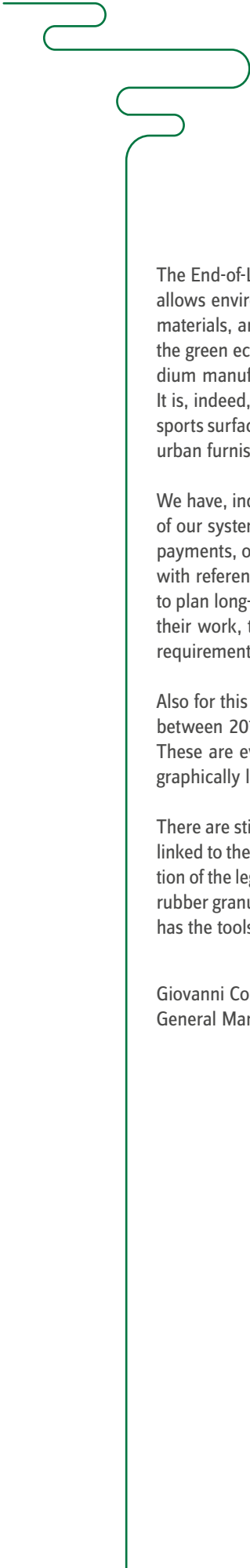
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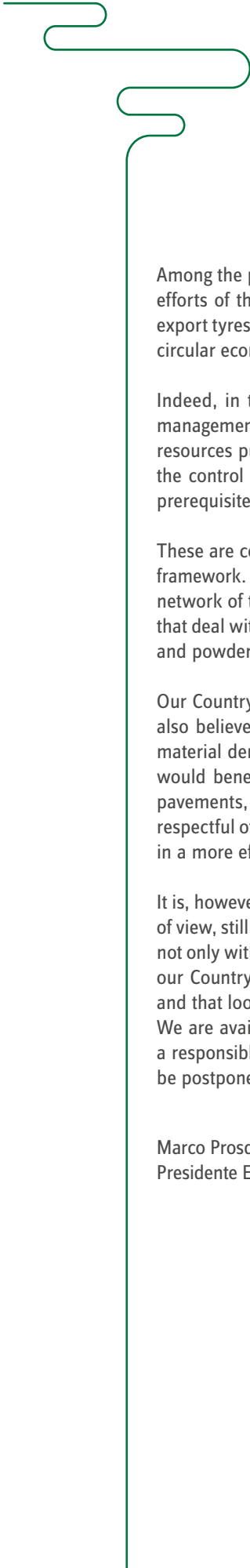
The End-of-Life Tyre chain managed by Ecopneus creates wealth and occupation; it allows environmental savings for the Country; it reduces emissions, the use of raw materials, and water consumption. Moreover, it favours companies' investments in the green economy chain. A well-structured productive system, based on small-medium manufacturing enterprises spread out on the whole Italian national territory. It is, indeed, thanks to their recycling of End-of-Life tyres that it is possible to obtain sports surfaces, long-lasting, "silent" modified asphalts, acoustic insulation elements, urban furnishing, and energy.

We have, indeed, been able to give stability and shared objectives to the companies of our system. The guarantee of the flows of material to be treated, the certainty of payments, our special attention to quality management within the companies, both with reference to products and processes, all these things have allowed companies to plan long-term investments and implement processes for improving the quality of their work, thus offering products that are more and more complying with market requirements.

Also for this reason, in the Ecopneus chain there was a 64.8% occupational growth between 2011 and 2016, with about 900 employees dedicated to End-of-Life tyres. These are even more important data if we look at where the companies are geographically located, as over a third of them are in the South of the Country.

There are still some uncertainties about this sector on the horizon. These are mainly linked to the development of the GPP (Green Public Procurement) and to the publication of the legislation related to the End of Waste - that is, the definitive classification of rubber granules and powder as materials. The chain of End-of-Life Tyres of Ecopneus has the tools, the skills, and the vision to be able to seize all opportunities.

Giovanni Corbetta  
General Manager Of Ecopneus

A decorative green line graphic starts at the top left, forms a series of loops and curves, and then extends as a vertical line down the left side of the page.

Among the paradoxes we are living these days, one makes direct reference to the efforts of those who, such as Ecopneus and its partner companies that import/export tyres, is daily committed to transform the great objectives and values of the circular economy and sustainability into concrete action.

Indeed, in the face of a constant effort in research, technological innovation, management efficiency and efficacy, as well as the rigorous management of the resources put at disposal by the citizens and for the transparency in reporting to the control bodies and the same citizens, it sometimes seems that an essential prerequisite is missing.

These are complex issues and they are ruled by an equally elaborated regulatory framework. The latter, in general, is still inadequate to the needs the entrepreneurial network of the national chain requires, both from the point of view of companies that deal with ELT treatment, and the companies that use recycled rubber granules and powders.

Our Country is ready and, as Ecopneus, we believe we have done our share. We also believe that we must carry on giving our contribution in order to give this material derived from ELT recycling the definitive drive towards applications that would benefit from its excellent characteristics to reduce noise and make road pavements, create sports surfaces which are more environmentally friendly and respectful of the athletes' wellbeing, soundproofing buildings, and produce energy in a more efficient and sustainable way.

It is, however, necessary to overcome those obstacles that, from a legislative point of view, still prevent this perspective from being fully established. We must comply not only with the ever urgent global sustainability objectives, but we must also give our Country a concrete perspective of economic and occupational development and that looks to the future.

We are available to give our contribution wherever it is required and possible in a responsible way, guided by the certainty that this is the right way and it cannot be postponed anymore.

Marco Prosdocimi  
Presidente Ecopneus



## 2011 - 2018 RESULTS

In-depth analyses and independent researches on health and safety (REACH, Ist. Mario Negri)

Constant dialogue, confrontation and in-depth analyses with the Public Administration (PA)

Contribution to technical standardisation process (UNI, CEN)

Education and information (schools, citizens, web)

**1,814,101**  
tonnes of  
collected ELTs

of which: over 121 thousand tonnes  
of ELTs collected **extra target**

15 historical stocks have been emptied, there included Italy's largest ELT stock

Extraordinary intervention in the so-called "Terra dei Fuochi": 21,433 tonnes

**RECOVERY\***  
material /energy  
from 30 / 70% to **56 / 44%**

SPORTS  
FLOORINGS

ASPHALTS

INSULATION

ENERGY

Contribution to the national debate on the Green Economy and the Circular Economy.

\* In the course of time, a calculation model of the recovered material quantities has been developed and perfected, taking into consideration not the conferral "at gate" of the plants, but the effective recovery to the aims of the working and separation processes; thus, the two values can be compared only partially.



# THE RESULTS OF ECOPNEUS

## AT WORK FOR ITALY'S CIRCULAR ECONOMY

The management of End-of-Life Tyres (ELTs) in Italy represents a case of excellence at international level. Indeed, our Country has been able to bring to speed a management system that covers all national territory extensively and that has guaranteed the collection and recovery of 100% of ELTs that have been legally placed on the spare parts market since 2011.

Within the scope of this system, Ecopneus manages an average of over 220,000 tonnes of ELTs all over the national territory every year. It carries out continuous and detailed interventions in every Italian region and province, thus assuring the collection of ELTs even in hard-to-reach areas. Ecopneus collects every type and dimension of ELTs: from large construction site vehicles, to small city cars.

### BUT THE CHALLENGE DOES NOT END HERE.

Today, the main objective for both the present and the future of our Country is to set up a circular economy. It is a lynchpin for the protection of the natural environment and for an economy that looks to the future, making sustainability a fundamental element of development and new qualified jobs, thanks to research and innovation. Ecopneus has always known that its main objective is the following: on top of waste management, its commitment has always focused on the **promotion of the uses of recycled rubber**, the market of its applications, and the qualification of the companies of the chain, basing its work on **ethics and legality**.

## THE WORK OF ECOPNEUS

towards a **CIRCULAR ECONOMY**  
that is more and more based  
on market dynamics.



## THE VALUES OF ECOPNEUS



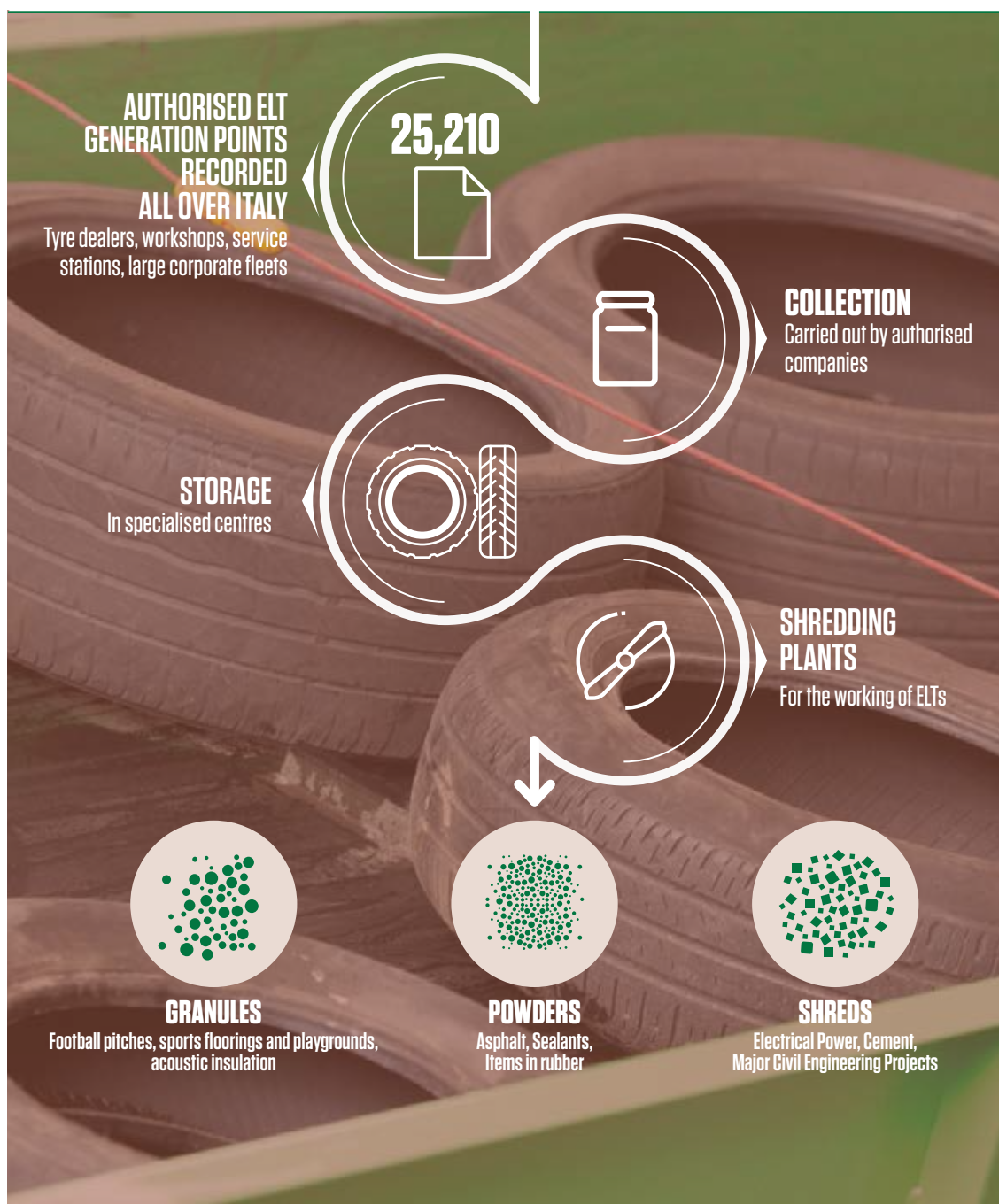
# HOW THE SYSTEM WORKS

Every year about 350,000 tonnes of End-of-Life Tyres are managed in Italy - this is equal to the weight of over 38 million automobile tyres - recovered from motor vehicles, two-wheeled vehicles, lorries and even from large motor vehicles used in quarries and agriculture.

Ecopneus is responsible for the tracking, collection, and recovery of a quota of the total which is equal, in weight, to what was put on the spare parts market by its partners during the previous solar year. This corresponds to an average of over 220,000 tonnes every year.

To guarantee this, Ecopneus coordinates and supervises a chain of over 100 companies all over Italy. A network of qualified companies, selected in a transparent way by the means of e-tendering, that guarantees the correct recovery of all ELTs under the responsibility of Ecopneus.

**220,000 tonnes/year**  
of ELTs managed by Ecopneus



## REGULATORY SCENARIO

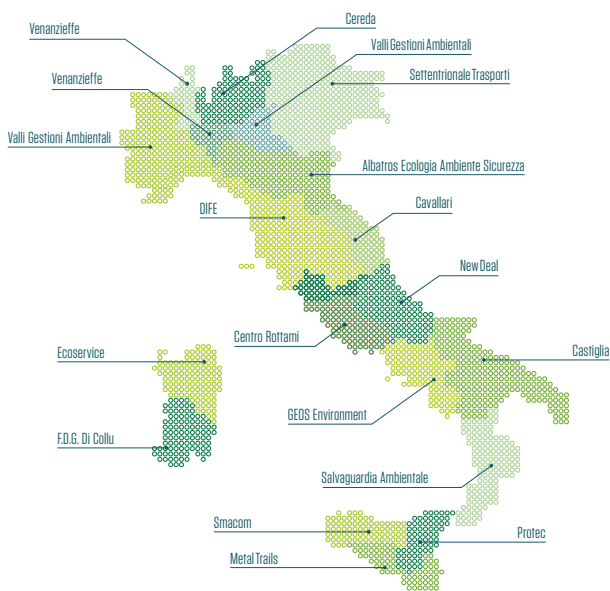
Art. 228 of the Decree Law 152/2006: tyre producers and importers are obliged to provide for the management of an amount of ELTs equal to the one placed on the spare parts market during the previous solar year, thus applying the **Extended Producer Responsibility**. This is an organizational model recommended by the European Commission and adopted by the majority of the Member states.

**The Ministerial Decree (MD) of 11<sup>th</sup> April 2011 n.82** implements art. 228. It was published on the Official Gazette on 8th June 2011. This MD started the ELT recovery national system in Italy, establishing the operative and managerial modalities of the new system: who the subjects **responsible** are, how the

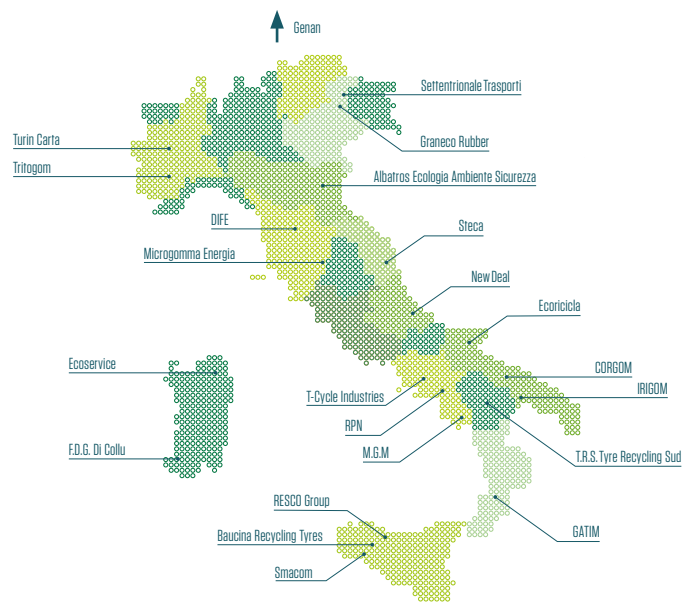
ELT amounts are to be **managed** and their related **eco-fees**; who the **control bodies** are and what the sanctions are in case of non-compliance.

On behalf of its partners, Ecopneus carries out all legal obligations, there included the traceability and accountability towards the Authorities, with an appropriate IT system, in order to certify the flows of ELT amounts, from their generation to their collection and use, as well as the economic accountability and the reporting of the amount placed on the market every year. In case they were not to meet their target, producers and importers shall be subject to sanctions.

## PARTNERS' NETWORK. UPDATE ON 1<sup>ST</sup> JANUARY 2019



Collection



Shredding and Granulation



# ELT COLLECTION REGION BY REGION



\*An extra amount of 5.751 tonnes is to be added to the ordinary collection as a consequence of the extraordinary collection carried out with 30% of the operating surplus with reference to the Protocol of the Terra dei Fuochi.



## Abruzzo 5,782

Chieti	2,268
L'Aquila	1,243
Pescara	977
Teramo	1,294

## Basilicata 2,805

Matera	918
Potenza	1,887

## Calabria 11,670

Catanzaro	1,728
Cosenza	4,771
Crotone	1,400
Reggio di Calabria	3,027
Vibo Valentia	745

## Campania 18,515

Avellino	1,778
Benevento	1,146
Caserta	3,366
Napoli	8,083
Salerno	4,143

## Emilia-Romagna 22,593

Bologna	3,774
Ferrara	1,509
Forlì-Cesena	1,370
Modena	4,268
Parma	3,218
Piacenza	1,816
Ravenna	1,632
Reggio nell'Emilia	3,608
Rimini	1,398

## Friuli-Venezia Giulia 3,842

Gorizia	512
Pordenone	832
Trieste	801
Udine	1,697

## Lazio 20,884

Frosinone	2,559
Latina	2,860
Rieti	857
Roma	13,636
Viterbo	973

## Liguria 3,731

Genova	2,188
Imperia	411
La Spezia	763
Savona	369

## Lombardia 30,224

Bergamo	3,367
Brescia	3,926
Como	1,762
Cremona	1,042
Lecco	1,093
Lodi	821
Mantova	982
Milano	7,996
Monza e Brianza	2,463
Pavia	1,633
Sondrio	1,036
Varese	4,103

## Marche 8,068

Ancona	2,377
Ascoli Piceno	1,056
Fermo	1,065
Macerata	1,611
Pesaro e Urbino	1,959

## Molise 1,449

Campobasso	1,020
Isernia	429

## Piemonte 11,482

Alessandria	1,560
Asti	543
Biella	670
Cuneo	1,928
Novara	827
Torino	4,545
Verbano-Cusio-Ossola	691
Vercelli	718

## Puglia 20,013

Bari	8,062
Barletta-Andria-Trani	1,900
Brindisi	1,452
Foggia	2,885
Lecce	3,437
Taranto	2,277

## Sardegna 11,741

Cagliari	4,329
Carbonia-Iglesias	639
Medio Campidano	741
Nuoro	1,548
Ogliastra	674
Olbia-Tempio	1,495
Oristano	1,076
Sassari	1,240

## Sicilia 17,863

Agrigento	1,049
Caltanissetta	1,010
Catania	5,098
Enna	792
Messina	3,113
Palermo	2,630
Ragusa	1,272
Siracusa	1,466
Trapani	1,433

## Toscana 13,352

Arezzo	1,606
Firenze	3,504
Grosseto	1,127
Livorno	889
Lucca	939
Massa-Carrara	887
Pisa	565
Pistoia	1,454
Prato	776
Siena	1,605

## Trentino-Alto Adige 8,735

Bolzano	3,332
Trento	5,404

## Umbria 3,994

Perugia	2,907
Terni	1,087

## Valle d'Aosta 660

Aosta	660
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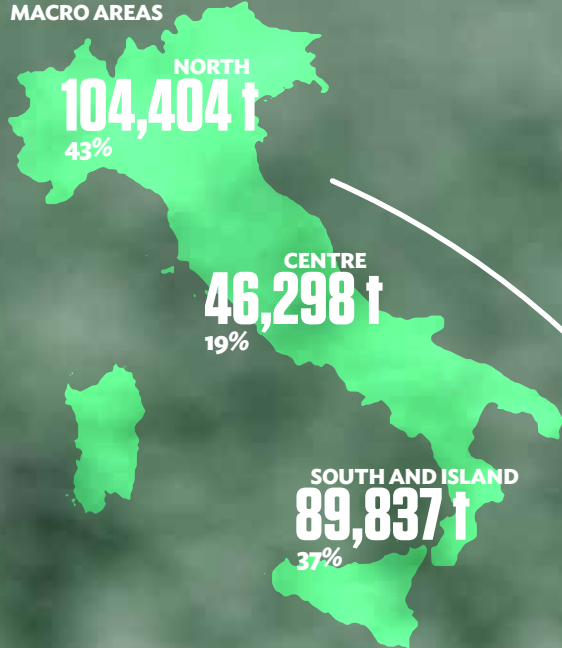
## Veneto 23,136

Belluno	848
Padova	4,284
Rovigo	1,161
Treviso	3,887
Venezia	3,224
Verona	5,545
Vicenza	4,189

Values expressed in tonnes



ELT COLLECTION BY  
MACRO AREAS



**25,210**

ELT Generation Points  
served: tyre dealers,  
workshops, service stations,  
body shops, farms.

**61,875**

requests of collection  
satisfied by collection  
companies.

**HIGHLIGHTS  
2018**

**+7 %**

Extra Target  
collection.

**240,539 t**  
ordinary collection.

**921 t**

emptying of  
historical stocks.

**4,830 t**

intervention in the  
Terra dei Fuochi.

**117 M€**

saved on national imports  
of raw materials.

**1,760,958**

m<sup>3</sup>  
saved  
water.

**381,255**

t CO<sub>2</sub>eq  
avoided CO<sub>2</sub>  
emissions.

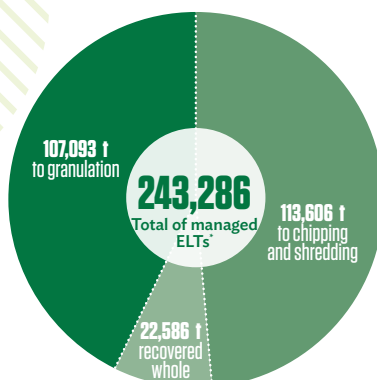
**368,637**

non-consumed  
resources.

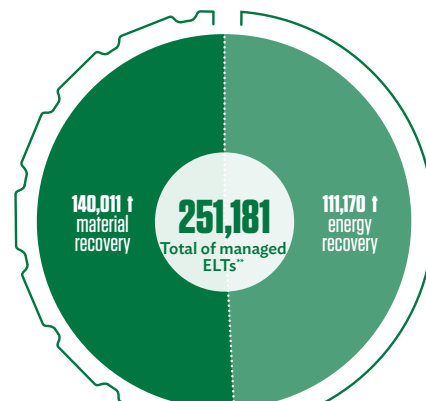


# ELT COLLECTION AND EFFECTIVE RECOVERY IN 2018

## ELT TREATMENT



## ELT RECOVERY



**56%**

**44%**

87,791 t  
of rubber

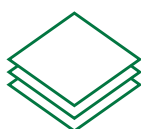
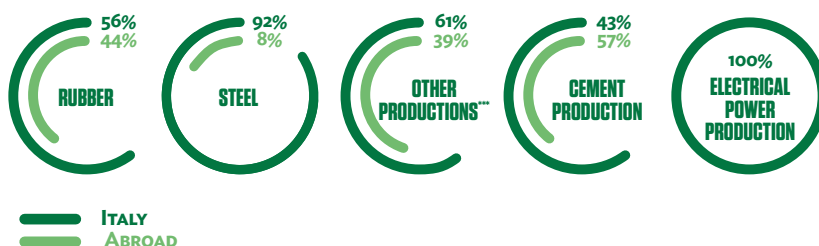
26,693 t  
of steel\*\*\*

25,527 t  
other materials  
and applications\*\*\*\*

89,845 t  
for the production  
of cement

21,325 t  
for the production  
of electrical power

## THE END MARKETS



**MATERIAL RECOVERY:**  
of it is carried out in Italy  
**65%**



**ENERGY RECOVERY:**  
of it is carried out in Italy  
**54%**

\* Total of ELT managed for recovery on 31/12/2018. This figure does not coincide with the overall total of the collection due to the ELT stocks conferred to the plants but not treated for recovery yet.

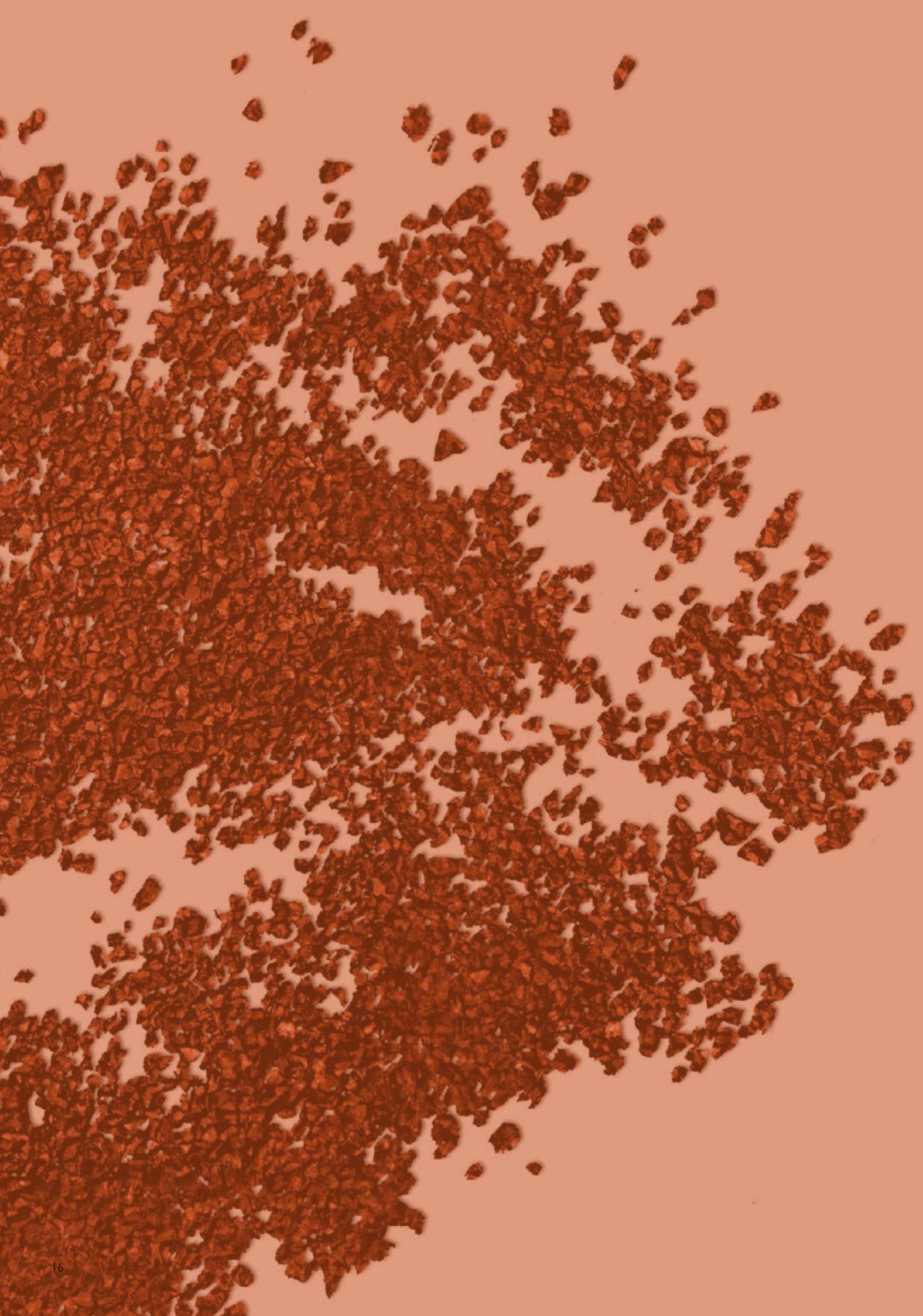
\*\* Total of ELTs handled for recovery on 31/12/2018. This number is higher than the total of the ELTs handled for treatment, as some stocks dating back to the previous solar year were also recovered in 2018.

\*\*\* Total of steel deriving from the treatment of ELTs and estimate of the quota of steel sent for granulation in foreign plants.

\*\*\*\* Ashes and metals deriving from combustion residues recovered in the cement production cycle.







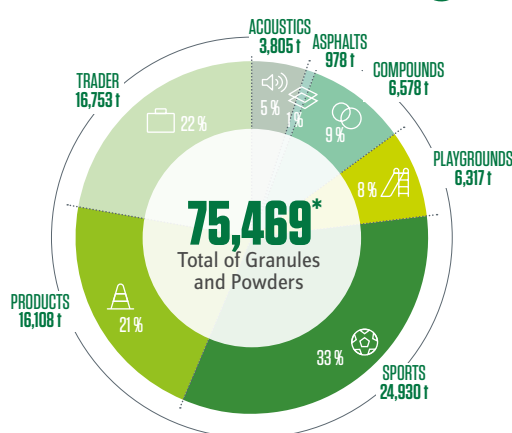
# RECYCLED RUBBER FROM ELTs

The recycled rubber from ELTs that leaves the working plants has the same exceptional characteristics of elasticity, resistance and ductility that transform tyres into objects with exceptional performances.

Nowadays several modalities of use valorise the excellent characteristics of this material all over the world. There are many already available and widely experimented applications, which in Italy, however, are still not widely spread and, as such, cannot absorb all the recycled rubber available on the national market.

In the following graph, it is possible to see an overview of the markets of use of granules and powders produced by the companies of the Ecopneus system in 2018.

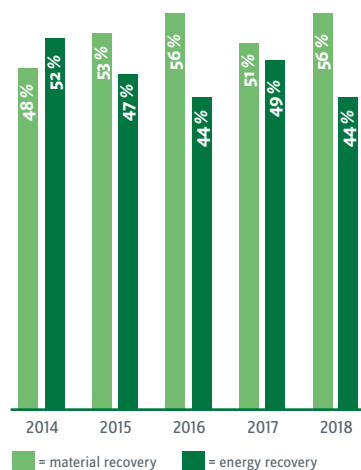
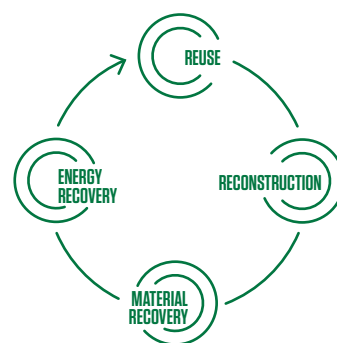
## THE RECYCLED RUBBER MARKET



\* The total makes reference only to the share of granules and powders produced by the Ecopneus chain and for which the final destination is known.

The commitment of Ecopneus for the valorisation of recycled rubber on the national market satisfies some basic assumptions:

- actuating the EU's **hierarchy** for waste management, preferring and prioritising material recovery and favouring the preparatory phases of reuse and reconstruction;
- accompanying and sustaining the consolidation and development of **the companies** of the sector for an ever better **quality of the material** leaving the plants;
- **promoting markets** for the available material, favouring the national horizon and keeping foreign markets as a second option.



All these actions are linked to positive effects that go beyond the correct waste management; they concern the stabilisation and promotion of **new jobs**, the creation of **new markets** for the companies, the creation of a segment of the **circular economy** that works. The latter, in perspective, shall feed itself on a single market logic. The incessant work of Ecopneus on these issues has contributed to the virtuous dynamic that, in the last years, has been possible to observe from the data on the relationship between material recovery and energy recovery of the recycled rubber from ELTs.



# THE MAIN FIELDS OF APPLICATION

## FOOTBALL

In synthetic turf sports surfaces, ELT granules are used as turf infill material and to make the layer under the playing surface. Moreover, ELT granules favour the levelling of the foundations, give elasticity to the surface, facilitate the energy restitution to the athletes and, at the same time, they drain rain water.



## BASKETBALL

The mixes used for the superficial layer of basketball sports surfaces are designed to obtain both an adequate shock absorption and an optimisation of the restitution of the elastic energy. This gives a perfect answer to the athlete's biomechanics needs; it also provides for a reduction in muscle fatigue, a reduction of micro traumas and an overall improvement of sports performances. Their resistance to all weather conditions make of these surfaces the ideal solution for outdoor courts and for those of the three a side basketball. Born in the 1980s, three a side basketball has become more and more popular. As such, it will debut as an Olympic discipline at the Tokyo 2020 Olympic Games.







Tyrefield is the state-of-the-art sports surface made with recycled rubber from End-of-Life Tyres. It has excellent performances, it cares about the environment and it gives economic advantages.



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



**Bologna FC1909** has chosen a synthetic turf football pitch with recycled rubber and organic materials infill for its sports centre of Casteldebole, in the city of Bologna. It is used also for athletes' rehabilitation.

## HORSE RIDING



For what concerns horse riding sports, in collaboration with the Department of Veterinary Studies of the Università degli Studi di Perugia and Uisp (Unione Italiana Sport Per tutti, Italian Union Sports for Everybody), Ecopneus is currently testing new solutions both for training fields and for horseboxes and stables in two centres in Orvieto (TR) and Todi (PG), as well as in the Veterinary Military Centre of the Italian Army in Grosseto. The use of rubber in training fields instead of sand avoids the dispersion of dust in the air and the related risks for horses' and horse riders' health. The rubber floorings for horseboxes of horse riding centres and stables guarantee, instead, comfort, insulation, and hygiene.



# THE MAIN FIELDS OF APPLICATION

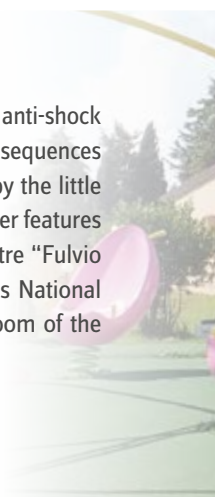
## TENNIS

By appropriately modulating the characteristics of the superficial layer with the thickness and the physical properties of the substratum in recycled rubber, it is possible to affect the surface response in tennis, thus satisfying the majority of athletes', managers' and most demanding coaches' requests.



## PLAYGROUNDS

Recycled rubber is an excellent material for the creation of playgrounds and anti-shock floorings for children's play areas, thanks to its capacity of softening the consequences of accidental falls and its long lifetime. For example, this is well known by the little Peppa Pig's fans who can play on a safe surface also in the presence of water features in Leolandia's theme park. Also the young athletes of Rome's Sports Centre "Fulvio Bernardini" know this very well, as well as the visitors of Legambiente's National Centre for Sustainable Development, "Il Girasole" - an open air show-room of the many uses of recycled rubber from ELTs.







## ATHLETICS

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Powder and granules in recycled rubber from ELTs are used together with polyurethane resins for the creation of athletics tracks. Thanks to a special design, it is possible to obtain floorings with specific characteristics that have been developed to satisfy multiple needs: from a more rigid flooring - appropriate for those who are looking for the maximum sprint - to a more elastic basic package for the training and cooling down phases.



# SPORTS FESTIVAL

## AT THE SPORTS FESTIVAL OF THE CITY OF TRENTO ATHLETES PLAYED ON RECYCLED RUBBER

The Sports Festival of the city of Trento turned "green" thanks to Ecopneus, which created two Tyrefield courts, one for basketball and one for volleyball. They were installed in Piazza Fiera from 11<sup>th</sup> to 14<sup>th</sup> October 2018.

The two Tyrefield courts were, respectively, 525 m<sup>2</sup> for basketball, and 360 m<sup>2</sup> for volleyball. They were created with anti-shock mats made with about 4,300 kg of rubber recycled from ELTs. For basketball, a removable surface with court lines was placed on the rubber layer. This system complies with the requisites of FIBA – the International Basketball Federation. Instead, for what concerns Tyrefield for volleyball, the rubber mat was covered with a specific coloured acrylic resin. The court lines were then painted on this layer of coloured resin. Three days of non-stop sports on Tyrefield surfaces; a temporary athletics track where the Paralympic champions competed; over 15,000 gadgets and brochures distributed. Meetings, conventions, and today's and yesterday's champions animated the event.

During the Festival, over 100 boys and girls took part in the basketball camp with **Giacomo "Gek" Galanda**, ex captain of the Italian National Team, gold medal at the European Championship in Paris 1999 and Olympic silver medallist in Athens 2004.









A woman with dark hair is playing a violin in a concert hall. The walls are made of vertical wood panels. The text 'ACOUSTIC INSULATION' is overlaid on the left side of the image, with a decorative white line graphic above it.

# ACOUSTIC INSULATION

Its characteristics of elasticity, resistance and soundproofing make of rubber from ELTs an excellent material for the limitation of the transmission of noise and vibrations in buildings. It may be used for soundproofing lofts (preventing noise from spreading among different floors of a building - the so-called "footfall sound"), as well as for filling up cavities between walls - thus avoiding the transmission of sound waves in adjacent rooms), and for creating vibration-damping bases for machinery and installations such as: elevators, air conditioning units, and boilers. These properties make recycled rubber a highly performing material. It is also competitive compared to other materials available on the market, both with reference to the creation of new buildings, and for renovations and requalification interventions, such as the one carried out on **Parma's Toscanini Auditorium**.

At the Music Production Centre "Arturo Toscanini", the homonymous Foundation, Ecopneus, Genesis, the Architecture Firm Studio A+C, and the City of Parma have, indeed, carried out an important acoustic intervention in the Gavazzeni Room. This is the largest rehearsal room of the structure: 400 square metres by 5 metres in height. The Acoustic insulation was carried out by the means of the insertion of 960mq of soundproofing panels containing over 3,330 kg of rubber recycled from End-of-Life tyres. The intervention was promoted also with the creation of a dedicated video clip with the musicians of the Filarmonica Toscanini and with the interview of Maestro Luigi Ferrari, the Superintended of the Toscanini Foundation at the time.

# "SILENT" AND LONG-LASTING MODIFIED ASPHALTS

As of today, in Italy there are over 470km of roads made with asphalts modified with recycled rubber. The interest in this application is constantly growing. The addition of rubber powder modifies the physical properties of bitumen, improving the overall performance of floorings. This allows:

- **a noise reduction up to 7 Db.** This corresponds to about the halving of the noise perceived by human beings;
- **surface duration up to 3 times** longer compared to traditional asphalt;
- **greater surface resistance** to cracks of all sorts, with a reduction of maintenance interventions and their related costs and inconvenience suffered;
- **greater safety** thanks to better water drainage, with greater grip, better visibility, and less potholes.

Ecopneus is a member of the **LIFE Nereide project (Noise Efficiently Reduced by recycleD pavements)**. This is a project co-financed by the European Union. Its aim is to optimise acoustic benefits, the reduction of air pollution and of the overall environmental impacts thanks to the use of road surfaces made by adding recycled rubber and asphalt millings. This is the material obtained from the recovery of old road surfaces and used in replacement of the commonly used raw minerals. Head of the project started in 2016 is the **Department of Civil and Industrial Engineering of the University of Pisa**. The project has been developed in collaboration with **ARPAT** (Tuscany's Regional Agency for Environmental Protection), the Belgian research centre **BRRC** (Belgian Road Research Centre), **IDASC-CNR** (the **Institute of Acoustics and Sensoristics "Orso Mario Corbino"**), and **Region Tuscany**.

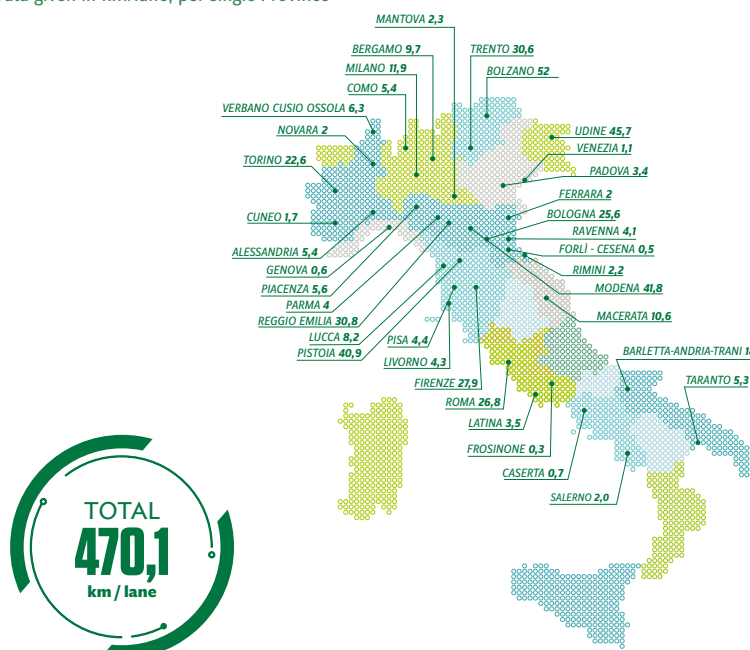
Road surfaces with low sound emission asphalt have been created in Massarosa (Lucca), Arezzo, and Castiglion Fiorentino (AR). In Ghent (Belgium) an experimental piece of road surface has been created using PERS porous elastic surfaces.

[www.nereideproject.eu/](http://www.nereideproject.eu/)



## Asphalts modified with rubber powder from ELTs in Italy

Data given in km/lane, per single Province





# ENERGY FROM ELTS

Ecopneus is strongly committed to the recycling of ELT-derived rubber. It is equally dedicated to the preparation of ELT recovery as derived fuel for the production of energy for those quantities of ELTs that the market of applications cannot use every year. This sector represents a **fundamental component for the closing of the ELT recovery cycle**, above all because the internal market of rubber recycled from ELTs is still not sufficiently mature to be able to absorb all available material. The second reason is linked to regulatory 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 at its best. Rubber calorific power can be compared to the one of pet-coke, and its high temperatures guarantee the compliance with the emission limits.

Moreover, the use of this process allows to recover as materials combustion residues, ashes and steel. These are then incorporated into the finished product. This avoids the use of other virgin raw materials, **thus creating an environmental and financial benefit** for both companies, and society. To a lesser extent, the ELTs treated for energy recovery are sent to plants for the production of electricity.

Thus, also for energy recovery, ELTs possess characteristics that make of them a valuable resource:

- **High calorific power**
- Use in replacement of other fuels that are richer of negative components  
As a consequence, this **improves the emission scenario** of the plants
- In the production of cement, **functional use also of the steel** present in the tyre.

In 2018, the recovery of ELTs for the production of energy (whole, shredded or chipped ELTs as well as textile fibres separated during the production of granules and powders) was carried out in the following percentages: **57% in Italy** (in 4 cement factories and 1 power plant); the remaining **43%** was recovered in **foreign cement factories**, mainly in Turkey (54.2%), South Korea (26.1%) and Romania (19.5%). A sensibly lower amount was sent for recovery through pyrolysis in the Republic of Slovakia (0.3%).

Differently from the previous years, there were no delivery of ELTs for energy recovery in Morocco and other non-OECD countries. This is due to the amounts charged for guaranteeing the transport of ELTs towards those destinations, which make these deliveries excessively expensive.









# THE ENVIRONMENTAL BENEFITS

## CARBON FOOTPRINT

It measures the overall amount of greenhouse gases directly and indirectly produced during the life cycle of a product or an activity. The negative value associated to the activities of Ecopneus shows that the avoided emissions (thanks to material or energy recovery), are greater than the ones produced by the analysed process.



## Balance of RESOURCES

# -368.637

t of materials

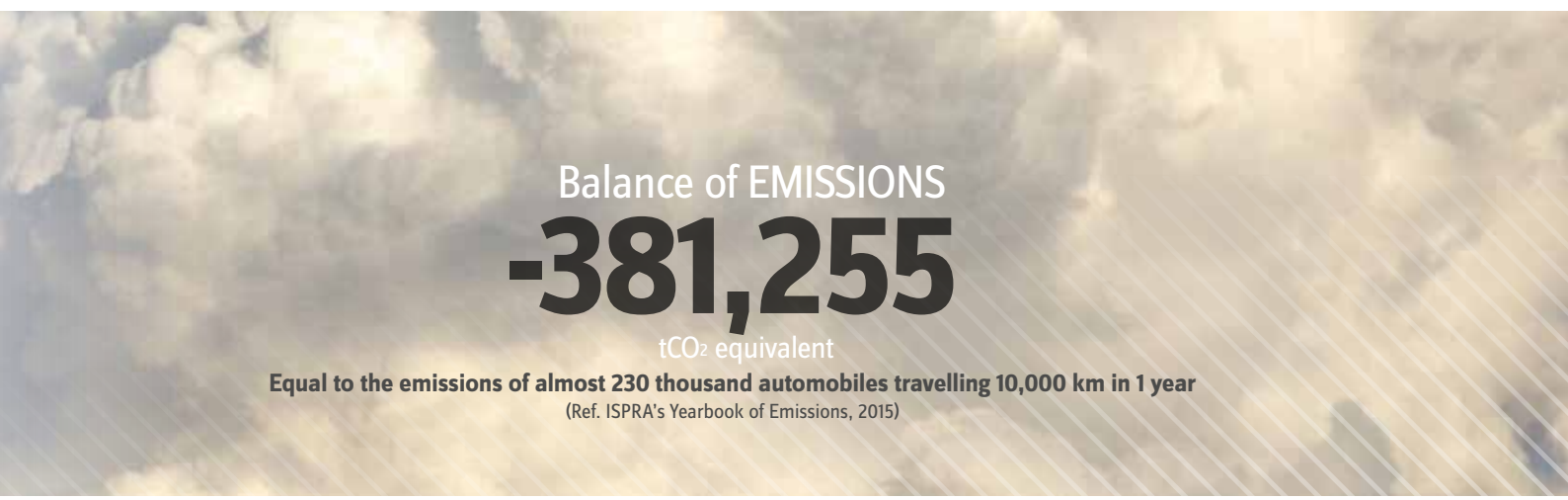
Equal to the weight of 752 "Frecciarossa 1000" high-speed trains with 8 wagons plus locomotive  
(Ref. Producer's technical sheet)

## 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 service or good during its life cycle. A negative value of this indicator states that the amounts of non-consumed and non-contaminated water thanks to material or energy recovery during a product life cycle, is higher than the one which, vice-versa, has been consumed to satisfy the various analysed activities.







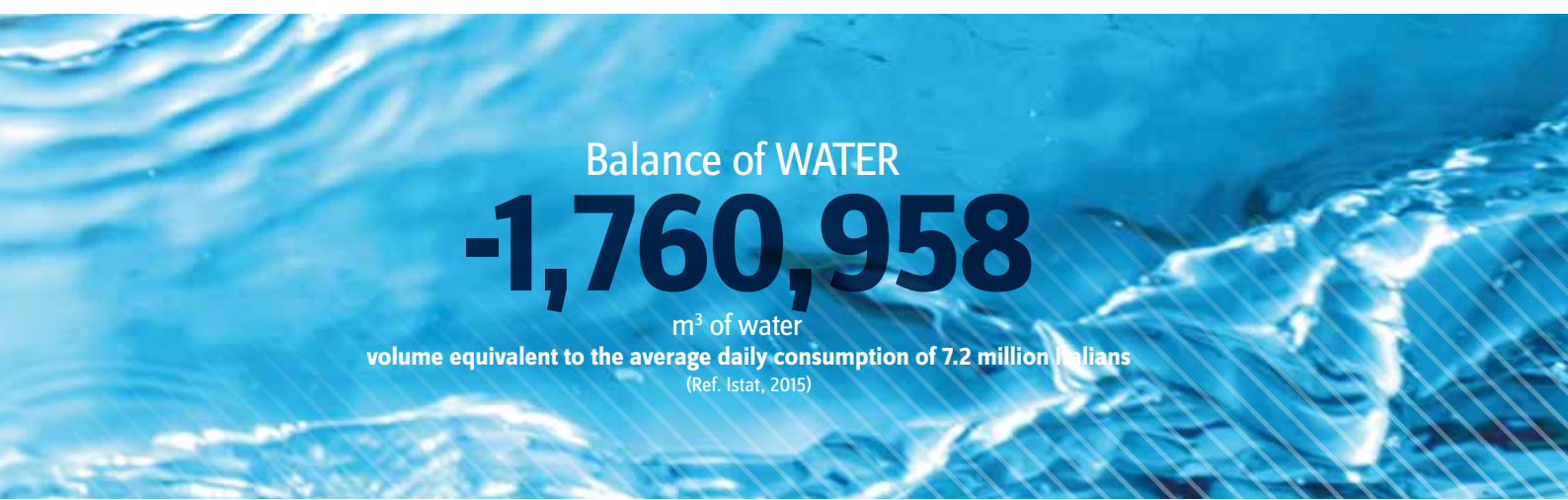
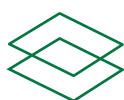
Balance of EMISSIONS  
**-381,255**  
tCO<sub>2</sub> equivalent

Equal to the emissions of almost 230 thousand automobiles travelling 10,000 km in 1 year  
(Ref. ISPRA's Yearbook of Emissions, 2015)



## MATERIAL FOOTPRINT

It represents the overall flows of mineral and fossil resources that have been extracted for the production of a specific service or good along its life cycle. The negative value indicates that the positive impact connected to the resources that have not been extracted and used thanks to the material or energy recovery along a product life cycle is higher than the negative one linked to the consumption of the material necessary for the carrying out of the same activities.



Balance of WATER  
**-1,760,958**  
m<sup>3</sup> of water

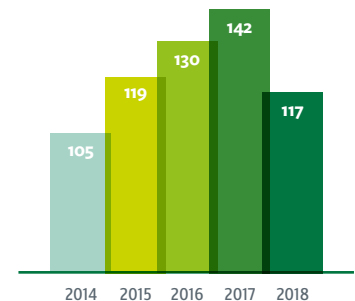
volume equivalent to the average daily consumption of 7.2 million Italians  
(Ref. Istat, 2015)

# ECONOMIC BENEFITS FOR THE COUNTRY

The benefits deriving from the activities of Ecopneus can be seen also from a financial point of view. First of all, there are benefits in terms of **savings on importation of virgin raw materials**. These are replaced with the materials recovered by the managed ELTs. In 2018 such savings amounted to **117 million Euros**. This amount is similar to the one obtained in 2015 and, thus, it has decreased compared to the previous two-year period. This is mainly due to the sharp fall of the average rubber price in 2018, despite the quantities of granules and powders sold remained substantially unchanged.

In 2018, the economic value generated by eco-fees amounted to **71.2 million Euros**. The economic value distributed to cover all costs incurred for the running of the system amounted to **63.8 million Euros**. Net of the economic value distributed to cover all costs incurred for the running of the system, **16% of the total**, over 10 million Euros, was used to cover general costs, such as overheads, communication and several research projects sponsored to support the recycling market chain.

SAVINGS ON IMPORTATIONS OF MATERIALS  
M of Euros

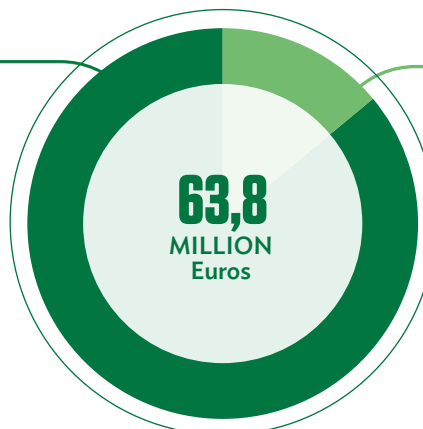


## ECONOMIC VALUE DISTRIBUTED €



**84 %** CHAIN COSTS

47,0%	Collection
12,0%	Transportation
20,0%	Shredding Granules / Powders
14,9%	Shredding Shreds / Chips
5,9%	Energy recovery
0,2%	Other costs



**16 %** GENERAL COSTS 

50,6%	Quality, research, development and promotion of applications
10,0%	Personnel
21,7%	Taxes
0,2%	Capital
17,5%	Other costs

**5,2 MILLION** Euros  
for research, development and innovation

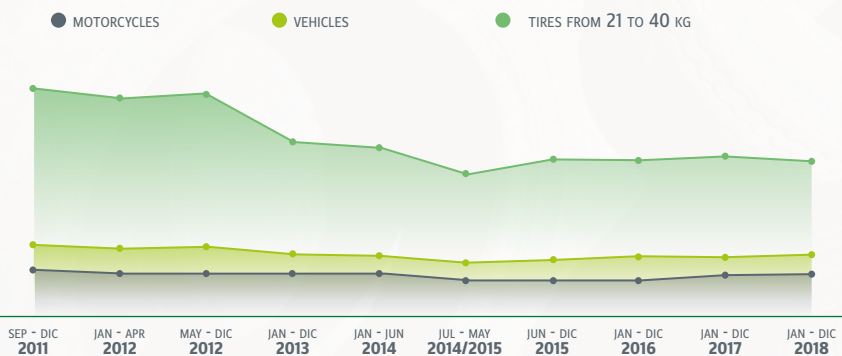
The careful and **rigorous management of the financial resources** from the part of Ecopneus contributes to the stability of the companies of the chain. This is due to the fact that the same companies can rely on certain and regular payments, as well as on the guarantee of receiving constant flows of materials to be treated.

**The transparency** on the use of such resources guarantees the respect of the legislator's mandate and the strictest interpretation of its own role as a non-profit body.

The value of eco-fees is constantly checked and, eventually, modified with reference to a better system management.

**The aim is cost minimisation for the consumer.**

## THE TREND OF ECO-FEES: MINIMISATION AND STABILITY





# THE CHAIN OF THE ECOPNEUS SYSTEM

The data analysis and the description of the Ecopneus System allows important comparisons through time. These can be carried out, in particular, from 2011 (the year in which the company was formed) to 2016 (latest year available with reference to budget databank). A recent research of the "Fondazione Symbola per le Qualità italiane" (the Symbola Foundation for Italian Quality) has identified six dimensions in which the existence of an "Ecopneus Effect" has been observed. This effect can be measured in the system of the involved companies:

<b>OCCUPATION</b>	<b>EFFICIENCY</b>	<b>BALANCE</b>
<b>CIRCULARITY</b>	<b>AUTONOMY</b>	<b>QUALITY</b>

**OCCUPATION** Looking at jobs directly related to the chain of End-of-Life Tyres in the companies of the Ecopneus chain, a growing trend has been observed. Even if it has not grown regularly in the course of time, it has, nonetheless, been more positively accentuated compared with the overall employment of the same companies, that is, taking into consideration also the employees dedicated to activities that are not related to the ELT chain.

**EFFICIENCY** The operative management of the flow of material guaranteed by the Ecopneus System and the investments in innovation have stimulated a growth in efficiency in the companies of the chain. Indeed, they have been able to improve the relationship between the incoming material and the received resources in the course of time, thus the optimisation of the costs related to the ELT fee paid by Ecopneus to its partner companies.

**BALANCE** The strict auditing system applied to its chain by Ecopneus by the means of external qualified companies, the fully computerised management control and the careful selection of companies have brought the system to a gradual and constant improvement: the levels of efficiency tend to grow uniformly and to be aligned among companies.

**CIRCULARITY** The growing quality of the products made with recycled rubber together with the increase of its fields of application and of new markets have supported the expansion of the use of these materials, with a constant growth of the recovery of material.

**AUTONOMY** The companies of the chain are starting to organise themselves autonomously from the organisational and productive point of view. Indeed, in the period 2011-2016 the companies' autonomy index has clearly grown. This index is calculated as the relationship between the turnover related to the sales of products made with recycled rubber and the fee the companies have received for the activities related to the handling of ELTs.

**QUALITY** The growth in the quality of company management and processes can be measured also by the means of the constant increase of the production of higher quality granules. As a consequence, these granules are more valuable.

# EMPLOYMENT IN THE ECOPNEUS SYSTEM

## EMPLOYEES FULLY DEDICATED TO THE ELT SECTOR IN THE ECOPNEUS CHAIN

According to the Italian National Statistics Company (Istat), the companies of the Ecopneus system have an overall number of employees equal to 2,400 units. Of these, about 900 are fully employed in the Ecopneus chain.

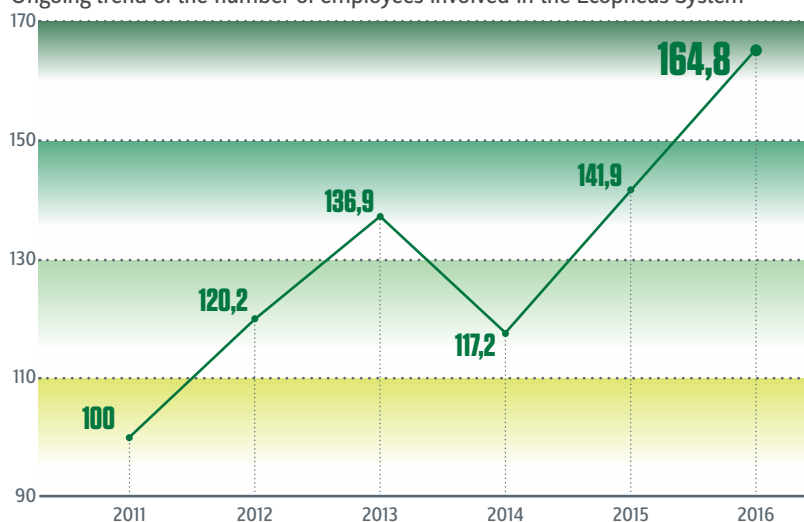
These data confirm constant occupational growth in the course of time.

In particular, taking 2011 as a base equal to 100, the occupational growth of the Ecopneus system has been of +64.8% for what concerns the ELT component of the people employed. This amounts to an average yearly rate of +13.0%.

The increase related to the overall employment of the involved companies is equal to +12.0%, with an average yearly rate of +2.4%.

### EMPLOYMENT RATE

Ongoing trend of the number of employees involved in the Ecopneus System



SOURCE: Data processing carried out by the Symbola Foundation on behalf of Ecopneus, "Ecopneus Effect" Report.





# THE PROJECT FOR THE TERRA DEI FUOCHI



Since 2013, Ecopneus has operated within the scope of a Memorandum of Understanding signed with the Ministry of the Environment, the Prefectures and Councils of Naples and Caserta and the Prefect appointed by the Home Office for the Terra dei Fuochi. Ecopneus has put **extraordinary resources** at the disposal of this project. It has also carried out **interventions of collection and management of End-of-Life Tyres abandoned** on the territory of the Provinces of Naples and Caserta.

It is an extraordinary intervention aimed at contrasting the phenomenon of toxic fires by the means of the removal of the abandoned ELTs from the territory. Indeed, these ELTs are often used as igniter and fuel for fires.

It is a project that also has a strong component of information and education to legality to **contrast the "off-the-books" sale of tyres**, which is linked to the dumping of ELTs in the environment.

Many things have been done: educational projects, open-air initiatives, contests open to citizens, school initiatives with the aim of making culture and transforming the recovered ELTs into a regular size football pitch made with recycled rubber where children and teens can train both their legs and their head to legality in the town of Scampia.

- **40 Towns** involved in the Provinces of Naples and Caserta
- Over **21,400 tonnes** of collected ELTs
- **3 historical stocks emptied**: in Scisciano (NA), Naples "Gianturco", Villa Literno (CE)
- Over **1,000 students** involved in training and awareness-raising activities on "environment and legality" every year from 2013 to today
- Open-air initiatives and contests for citizens
- Creation of a regular size **football pitch** named after Antonio Landieri in the neighbourhood of Scampia in Naples
- **Playground and multi-purpose surface** in the Parco Verde neighbourhood in Caivano, (NA)





# THE INTERVENTION IN VILLA LITERNO

Thanks to Ecopneus, 4,390 tonnes of End-of-Life tyres were removed from an area in Villa Literno, in the Province of Caserta in less than two months. This was made possible thanks to the activities related to the "Protocol for the interventions of extraordinary collection of End-of-Life Tyres abandoned in the Provinces of Naples and Caserta".

According to the Minister of the Environment, General Sergio Costa: "the work of Ecopneus and these important repossessions are certainly heading towards the right direction for the protection of both the environment and health. Indeed, prevention is fundamental and it is one of the priorities we have been working on during the drafting of the Law on the Terra dei Fuochi (Land of Fires)". The operative activities of the Protocols are supported by the campaign "I choose the right way", which appeals against the purchase of tyres off the books. Indeed, this phenomenon has originated illegal tyre dumping in fields or along the roads. These abandoned tyres, then, trigger the fires this land is sadly famous for.

The choice of associating the activities on the territory with an information and awareness-raising campaign is linked to the objective of intervening with an immediate recovery, but also to build long-lasting results that may specifically help the younger generations to make responsible choices of legality for their future.



# SPECIAL PROJECTS

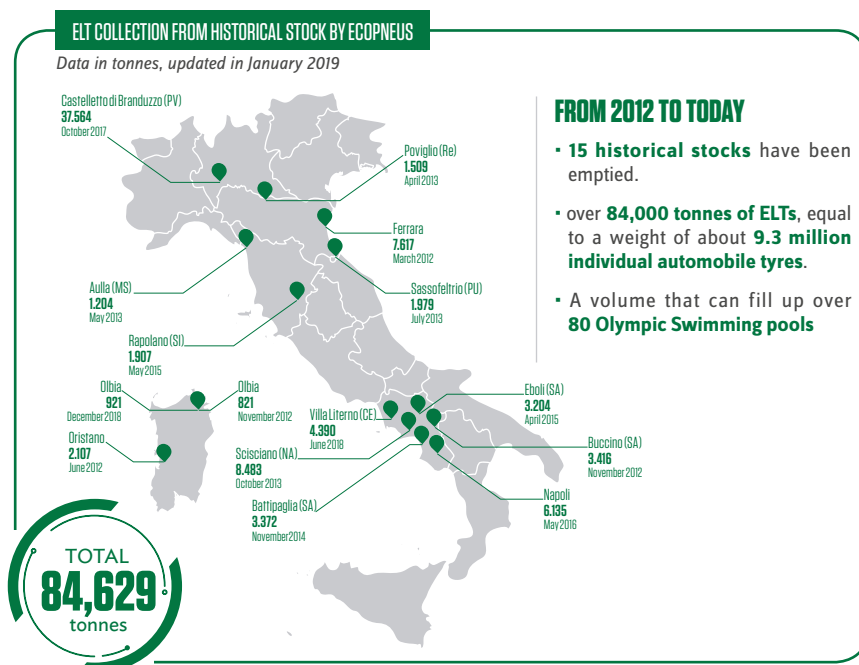
The objective of creating added value for the Country with environmental protection and towards the circular economy is well shown in the effort Ecopneus has made in certain projects they have followed in parallel - and in addition to - their ordinary collection activities. Examples may be: the interventions carried out on the historical stocks and the activities in the Terra dei Fuochi.

## THE EMPTYING OF 15 HISTORICAL STOCKS, FROM THE NORTH TO THE SOUTH OF ITALY

Until 31<sup>st</sup> December 2018\* the Ministerial Decree 82/2011 obliged the bodies responsible for the management of ELTs, such as Ecopneus, to dedicate at least 30% of their financial surplus (when available) to interventions of removal and emptying of the so-called "historical stocks".

These are piles of ELTs lying in companies that have gone bankrupt, industrial buildings, or in the natural environment and which were created due to the lack of a coordinated national system of collection and recovery of ELTs until 2011. Moreover, Ecopneus has mainly focused on Region Campania for the carrying out of these interventions. Indeed, 3 places have been emptied within the scope of the special project for the Terra dei Fuochi.

Among the various bodies responsible for ELT management in Italy, Ecopneus has put great and relevant effort in this field. Thanks to it, all historical stocks of large dimension in Italy have been substantially emptied.



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



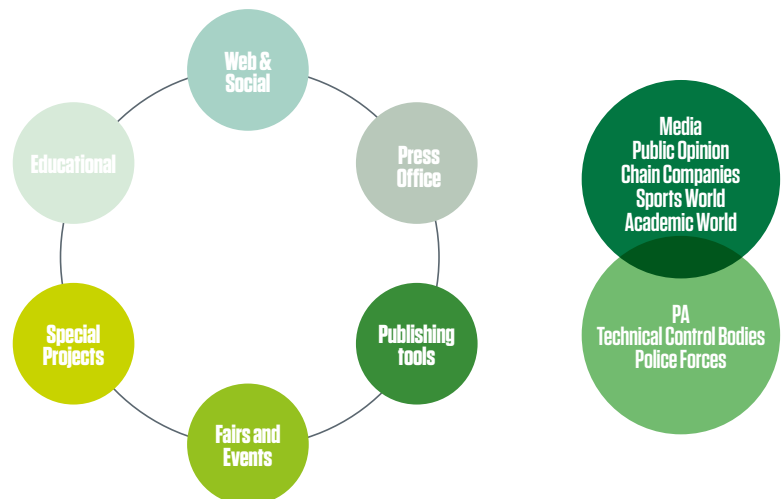
# THE COMMITMENT FOR COMMUNICATION

## SUPPORTING A CIRCULAR ECONOMY

The work made by Ecopneus for informing and raising the awareness of all of its stakeholders was born from this responsibility, in particular for what concerns the promotion of the applications of recycled rubber.

It is a responsibility entrusted by the same legislator with the MD 82/2011 and Ecopneus seriously believes in it. The promotion of a culture of sustainability, of a correct waste management, of choices of legality and of the adoption of a more sustainable lifestyle are crucial for the future of our Country.

## TOOLS AND TARGETS



## TOPICS

The benefits of recycled rubber from ELTs

The excellent performance of ELT rubber in its several applications

Promotion of demonstrative installations

Commitment for Legality

Incessant work on quality

The correct management of ELTs in Italy

The energy recovery of ELTs

The efficient management of economic resources

# TRAINING AND EDUCATION

## SUSTAINING THE CULTURE OF LEGALITY AND OF THE CIRCULAR ECONOMY

Since the beginning of its activities, the commitment of Ecopneus has been strong, constant, and diversified in this field. It has met and discussed with all interlocutors responsible or interested in ELT management in Italy. Ecopneus has also made a great effort into contributing to the development of a circular economy culture in our country.

### ELT ACADEMY

A format of workshops on the regulatory background of ELT management, its legislative and administrative aspects with the contribution of experts of the sector and organised in collaboration with Legambiente, the sponsorship of both ISPRA (The Higher Institute for Environmental Protection and Research) and of regional ARPAs (Regional Agency for Environmental Protection). Dedicated to the technical figures of Control Bodies, Police Forces, and Public Administration, the ELT Academy has seen over 1,600 participants with thousands of technical materials distributed

### 16 STAGES

from 2013 to december 2018



PFCU ACADEMY ECOPNEUS



# OBSERVATORY ON THE ILLEGAL FLOWS OF TYRES AND END-OF-LIFE TYRES IN ITALY

Ecopneus is the promotor of a round table for discussion and proposals on the topic of tyre illegal sale flows in Italy. It is a widespread phenomenon, from the North to the South of Italy, with very significant incidence data.

This phenomenon puts at risk the correct management of ELTs, because it places on the market tyres that have not been accounted for in the overall national total and, thus, they are out of the collection amounts allocated to the various operators.



**CAMBIOPULITO**

This initiative is now supported by the main interlocutors of tyre and ELT chains in Italy - a network of over 50,000 companies. Within the same network, "Cambio Pulito" ("Clean Change") was launched in May 2017. This is the first whistleblowing platform promoted by the private sector with such a wide potential participation, for the collection of anonymous reports on incorrect or illegal practices among companies, which generate unfair competition in the sector as well as the risk of ELT dumping.



# THE EDUCATIONAL PROJECT IN SCHOOLS

## THE EDUCATIONAL PROJECT FOR SCHOOLS

It is an educational project for the students of secondary schools that Ecopneus has been organising since 2013 in collaboration with Legambiente. This project has involved also the students of the Terra dei Fuochi: about **10,000 students** have been involved until now.

Every year this project focuses on a specific Italian region. It meets the students in their classrooms, it organises visits in factories that deal with ELTs, it prepares information materials, an event for an in-depth analysis on legality and sustainability and a contest.

Every year a jury of experts composed of representatives of **Legambiente, the Ministry of Instruction, the Ministry of the Environment** and **Ecopneus** awards sports surfaces and items in recycled rubber to the schools of the winning classes. These presents are strong messages of legality and environmental protection in those places where the new generations are formed.

## THE DONATIONS OF ECOPNEUS TO THE SCHOOLS WITHIN THE SCOPE OF THE EDUCATIONAL PROJECT



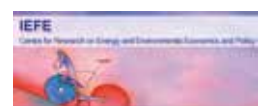
# RESEARCH, QUALITY AND INNOVATION ARE AT THE CENTRE

For the development of its activities, Ecopneus avails itself of the collaboration of external subjects. These, from time to time, supply competences, resources, and those necessary skills which are not already available within the deliberately lean structure of Ecopneus.

Such approach allows the involvement of the best collaborators for the reaching of the set objectives, the strategic analysis, the direction of the green strategy with a wide and more and more qualified vision.

These subjects technically and scientifically support also the communication, collaborating on the spreading of the projects and information and on the awareness-raising within all sectors of society.

## THE MAIN DEVELOPMENT PARTNERS OF ECOPNEUS





# THE NEW APPLICATIONS

## TYREPLAST: FROM RECYCLED RUBBER TO COMPOUND

Ecopneus and Idea Plast have created the project Tyreplast, aimed at creating innovative thermoplastic materials at the service of industry. New families of materials combine the elasticity and anti-vibrating properties of recycled rubber with the easiness of moulding of thermoplastic materials. With the support of the companies, new mixes with several plastic families have been created and the know-how has been made available to support their use along all productive chain - from the material to the product.

## THE COLLABORATION AND EXPERIMENTATION WITH MATREC ON POLYLAMINATE MATERIALS WITH RUBBER FROM ELTS

Continuation of the research and experimentation of new polylaminate materials in which the recycled rubber from End-of-Life Tyres has been coupled with leather, cork, fabric, bamboo, paper, wood, felt. These materials are worlds apart; however, once they have been joint together, they give a new identity to the rubber from ELTs, thus widening its different commercial uses: furnishing, design, boating, building, accessories.

## BUFFERS FOR SHOOTING RANGES

In collaboration with ballistics experts, an experimentation is currently ongoing with the aim of using recycled rubber in buffers for shooting ranges and for covering floors and walls in the shooting area. This would allow to replace commonly used materials, such as rubber and wood. Thanks to the property of rubber of absorbing shocks without deteriorating, this solution makes buffers last for longer; it avoids any eventual, dangerous deflection of the bullets, and it reduces the need for maintenance. Ballistic buffers in recycled rubber are currently being tested at some shooting ranges. They will subsequently be subject to certification from one of the authorised centres for the release of the conformity certificate.





# ECOPNEUS SHAREHOLDERS

AT 01/01/2019

A.R. Pneumatici  
Asperti Angelo  
Autogomma Perego  
B.R. Pneumatici  
Bellotto  
Bersangomme  
Bis  
Bridgestone  
Camso Italy  
Catania Gomme  
Cierrefe  
Citroen Italia  
Commerciale Pneumatici  
Continental  
D.p. Commercial Tyres  
Devalle Gomme  
Di Pasquale Diego  
Driver Italia  
Driver Servizi Retail  
Dropmotive  
Dst  
Emmegieffe  
Euromaster  
Euroreifen Ms  
Fca Italy  
Gexpo

Goodyear-Dunlop  
Gottardi  
Grassini Pneumatici  
Grg Pneumatici  
Harley - Davidson Italia  
Idio Ridolfi & Figli  
Marangoni  
Marangoni Industrial Tyres  
Mazzon Leonardo & C.  
Mercedes Benz  
Michelin  
Nuova Pneus Vignola  
Outlet Gomme  
Parise Gomme  
Perla Pneumatici Siena  
Picone  
Pirelli Tyre  
Pneus Service Italia  
Pneus Sette  
Points Italia  
Prometeon Tyre Group  
Re-Ta Gomme  
Rgs Pneumatici  
Rossi Lamberto  
Stilgomma  
Volkswagen Group Italia





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Ecopneus scpa  
Registered and Operative Headquarters  
via Messina 38 - Torre B  
20154 Milan (MI) Italy  
Tel.: +39.02.92.970.1  
Fax: +39.02.92.970.299

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Visit the website: [www.ecopneus.it](http://www.ecopneus.it)  
Or email: [info@ecopneus.it](mailto:info@ecopneus.it)



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