Ecopneus and value creation Sustainability Report 2011

ecopneus

il futuro dei pneumatici fuori uso, oggi

Ecopneus and value creation

Sustainability Report 2011

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Letter to Stakeholders

Tyre manufacturers have long made sustainability a cornerstone of their activities, of their investments and the direction of product research and development. Ecopneus is an expression of that commitment.

In the mid-1990s this awareness gave rise to the aim of creating an Italy-wide system to ensure the most comprehensive and efficient management of End-of-Life tyres. This was well before the introduction of a law that in September 2011 initiated the systematic collection and recovery of tyres in Italy.

The legislative principle of Producer Responsibility slotted into a path already taken internationally. Tools and management procedures were developed that closely followed previously established corporate policies.

The role of Ecopneus is to make this commitment concrete and even more visible to the consumer, connecting companies of different sizes and circumstances with the aim of recovering all End-of-Life tyres.

When activities began the founding shareholders - leading international tyre manufacturers - were joined by many other import and sales companies, to create the structure of Ecopneus that at the time of printing consists of 55 shareholders: a multifaceted universe, which represents most of the Italian tyre industry.

Shareholders are united by their common commitment but also by the operating procedures of Ecopneus, an independent entity, which informs its shareholders of the results achieved and new objectives, working largely independently and following well-defined rules.

This entity is focused on its responsibilities and has started working with Italian companies in the sector to grow and develop ELT recovery and recycle, an industry that in Italy for decades has suffered from the lack of a coordinated strategy and growth opportunities.

The new regulations effectively formalised the conditions for the creation of a virtuous system, bringing together everyone involved in the tyre and ELT industry, from production to the rehabilitation of

tyres for reuse in many and interesting applications.
The early months of activity, along with the consolidation of facilities and structures during 2012, have yielded results in terms of collection, but also in terms of the quality and commitment of Ecopneus' partner companies, and the value of the philosophy on which it is founded.
The commitment that we will continue to instil, with everyone playing their part and role, will ensure that the coming years confirm and consolidate the positive results achieved thus far.
All this includes a strong commitment to transparency, honesty and punctuality in reporting to the institutions and stakeholders. Members are legally obliged to continue to provide the conditions for Ecopneus to operate solidly and independently, thus creating a sophisticated, advanced and environmentally friendly product like the retread tyre, to make a practical fee to the creation of true recycling society.*

Alessandro De Martino
Past President Ecopneus

* April 2011 – April 2012

The introduction of the system of collection and recovery of End-of-Life tyres certainly made 2011 a good year for the environment and marked a step forward in the creation of a recycling society in Italy. Ecopneus, whose shareholders represent about 80% of the Italian tyre market, is the main operator in this new system and, as such, undoubtedly plays a leading role in defining its structure and takes on clearly defined responsibilities for the quality, honesty and transparency of its operation.

Aside from being consonant with the reputation and positioning of our members, it is for this reason that we decided to immediately introduce an accountability policy that exceeds the legal requirements, but that is in line with the distinctive values that guide our consortium's activities.

Our first Sustainability Report covers our activities from the official launch of the system on September 7th, 2011, to the end of the year, but also includes all the setup and preparation work done over the previous months and years. That work meant that we arrived at the launch date in a position to manage a complex chain of entities and large quantities of material.

The results achieved in the first months of operation were made possible by the great commitment of member companies in building this new system: a demonstration of their social and environmental responsibility and a statement of intent to bring Italy up to the ELT management performance levels of the other European countries where many of our shareholders operate.

However, these results would still not have been possible without the active fee of all entities operating at various levels as links in the long chain from production of waste to its recovery and that now constitute the virtuous circle of recycling. These include all ELTs generation points(tyre dealers, service stations, mechanic's workshops, etc.), collection companies, transporters, shredders, material recovery companies, and cement plants that use it as fuel. Then there is the

key role in this virtuous circle played by the central and local control authorities and institutions, universities and the research community, environmental and consumers' associations, members of the public, and individual consumers, whose environmental fee enables the entire system to function.
Our activities produce benefits for the community and the environment. However, more than this they represent a piece of that "Green Economy" we keep hearing about and that our country and others need as a driver of economic development that is environmentally, economically and socially sustainable. ELTs management system prevents Italy from breaking international law and produces the new economy and new jobs. It is a fee, albeit small and specific to the repositioning of Italy, the growth of a specialist recycling industry, technological development, and product and market innovation. It is a value that goes beyond what you see. Indeed, many of the applications possible with ELT-derived materials bring benefits in terms of the environment (e.g. noise reduction through the use of rubberized asphalt), economic (roads made with rubberized asphalt last up to three times longer than normal roads), social (e.g. rubber products for road safety). The effective management of the chain also reduces the amount of illegal disposal and makes tax tracking more transparent.
Our work has just begun. There are still many problems to solve, alliances to build, and activities to perform. However I believe, and I like to think I can say on behalf of everyone who has worked with us, that we have chosen the right path, one that will require still more effort and improved orchestration of all aspects of the system, but that will bring tangible benefits to Italy, its people, landscape, and businesses.

It is our task to achieve all this, while it is up to our associates and stakeholders to perform monitoring and measurements, and to suggest any remedial actions they consider useful or necessary.

Giovanni Corbetta
Managing Director Ecopneus

Approach to sustainability and reading guide

This Sustainability Report outlines the 2011 performance of Ecopneus consortium, starting with an analysis of corporate strategy, consistent with the principles of sustainable development and the company's mission. This document thus constitutes an important part of the company's broader path of transparency and traceability in relation to civil society and "interest bearers", presenting a synthesis of Ecopneus' short-and long-term objectives.
The report looks at the activities performed by the Ecopneus system during its period of operation in 2011. Having officially begun work in September, performing data analysis, and a first evaluation and measurement of performance, we thus look at the last four months of 2011, focusing where possible on estimates and assessments of trends.
In any case the company's decision to "be accountable" to its stakeholders for its activities and performance perfectly fits into the logic of transparency and service to the national economic system, which characterise Ecopneus.
As we will see below, the core business of Ecopneus is performed concretely and consistently along all three axes of sustainability Image 1 p. XIII:

- **Environmentally**, with the efficient management of collection and recovery systems and the recovery of the material derived from End-of-Life tyres, and an ongoing commitment to optimising the eco-efficiency of the chain;
- **Economically**, with efficient and effective management of the business, providing stimulus to an emerging market (that of the alternative use of ELTs) to innovate on solid bases, producing satellite industries and positive effects in the local communities;
- **Socially**, through the impetus to a culture of transparency and legality and the protection of the health and safety of the public.

Sustainability at Ecopneus

In general, the main challenge for a Sustainability Report is to find valid, measurable and to some degree standardised indicators of performance over time, which mean the activities of a particular organisation can be assessed within the overall landscape of society. It is for this reason we have decided to structure this document and its analyses and indicators, by following the directions of the **Global Reporting Initiative (GRI)**, an international standard for sustainability reporting that can be used by organisations of whatever nature, size, sector or country. The key principles of the GRI are based on the company's necessary transparency towards its stakeholders over its social, environmental and economic impacts in relation to commitments, strategy and procedures for managing the organisation.

The work done for this pilot edition of the Report is necessary for the structuring of the future editions of an articulated set of indicators for determining trends and monitoring the progress of the overall performance of Ecopneus.

The challenge of Sustainability Reporting

Before proceeding to illustrate the methodology used to compile this Sustainability Report, it is worth dwelling upon the theoretical framework within which a reporting system exists, which goes beyond the financial and economic performance of a company. The European Commission has defined Corporate Social Responsibility as: "a concept whereby companies integrate social and environmental concerns into their business operations and into their interaction with their stakeholders on a voluntary basis" (Green Book, 2001), and more recently as "the responsibility of companies for their impact on society" (COM2011, 681). These two definitions above all highlight the voluntary character that underlies the concept of CSR, in that a company chooses to adopt responsible behaviour from a social and environmental point of view, without any formal legislative requirement. It thus represents something more than mere compliance with legislation. Along with this voluntariness comes a company's decision to "report" its impact on society and the environment, with full transparency to stakeholders about the activities performed in the context of Corporate Social Responsibility. The core of these policies is the ability to integrate economic and commercial needs with social and environmental ones, which links directly to the concept of sustainability.

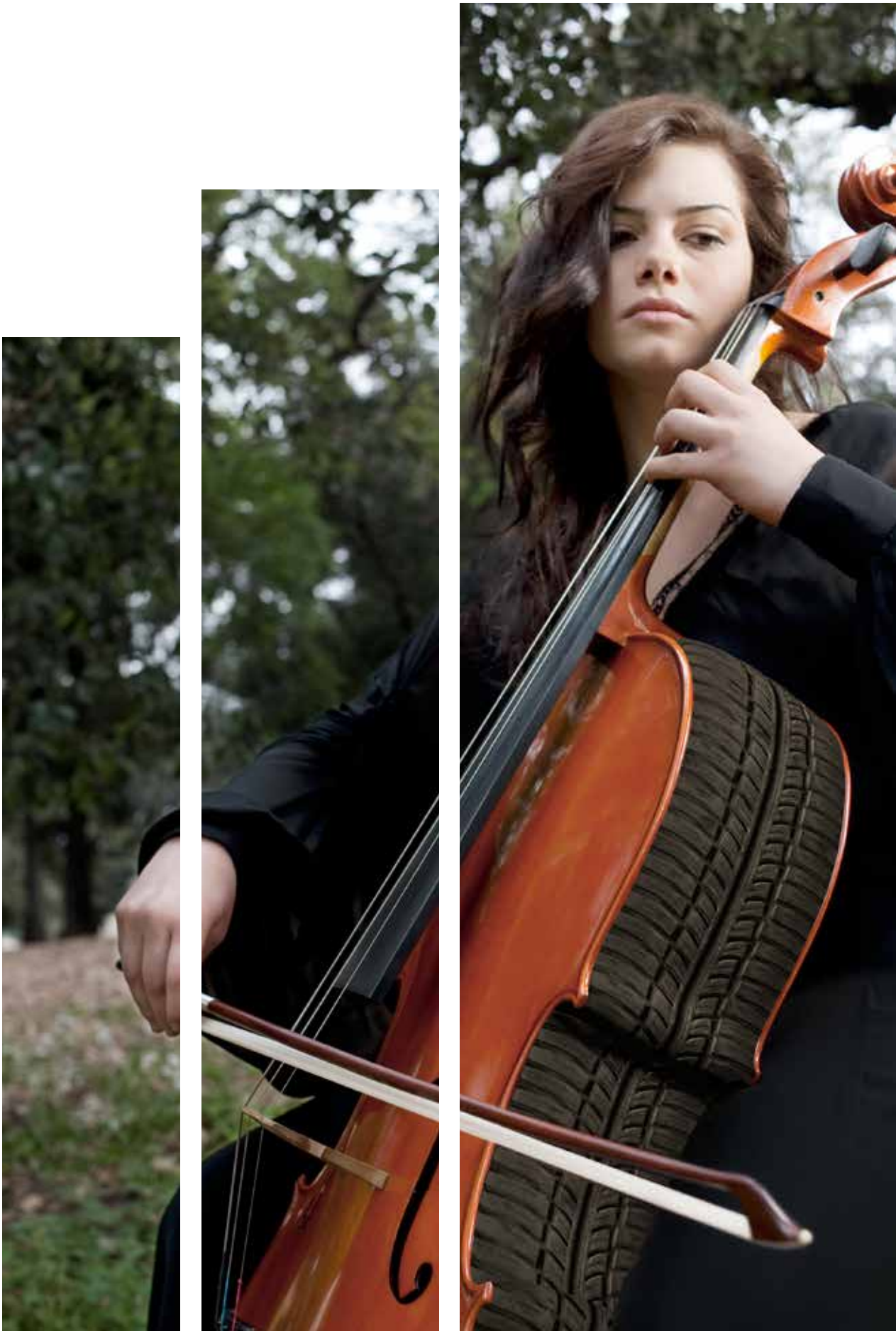
In particular, sustainability can be understood as "the ability to ensure the satisfaction of present necessities without compromising the ability of future generations to meet their own needs". The ultimate goal of sustainability is to ensure a development that meets the needs of present generations – and of the economic activity performed - without compromising the ability of future generations to meet their needs. The economic activity performed must be sustainable, and the life of the community in which the company is growing must also be sustainable from a social and environmental point of view. A key role in this process of responsibility and sustainability is played by the mechanisms for stakeholder engagement, therefore with all "interest bearers" sharing company's results, its sustainability strategy and the short and long-term objectives pursued. In this sense, a long-term corporate strategy, in which sustainability is an integral part of the business, as well as a vigorous reporting process can serve as a tool for improvement, with regular measurement of CSR performance.

Img. 1
Sustainability at Ecopneus

Responding to the GRI guidelines, and in order to clarify the structure of the document to ensure its readability, the analysis underlying this Sustainability Report has gone through the following phases:

- **Introduction**: An initial snapshot of Ecopneus, the regulations on which the company is based, a definition of its work – End-of-Life tyres - and a description of the ELT recovery chain;
- **Micro-level analysis**: With a description of the Company organisation, setting out the profile of Ecopneus and the context out of which its mission, strategy and corporate governance emerges;
- **Meso-level analysis**: With a description of the "Ecopneus system", a definition of entities that comprise it, chain management procedures and performance indicators obtained during the reported period;
- **Macro-level analysis**: Initial analysis on the impact of Ecopneus on the community, both in terms of improved waste management nationwide and the promotion of a common culture of legality as well as innovation in the Italian ELT market;
- **Strategy and future goals**: Priorities and guidelines on which the Company has decided to commit and invest in the short, medium and long term.

From a purely methodological standpoint, Ecopneus chose to commission a third party to prepare the final report on its activities. The Sant'Anna School of Advanced Studies of Pisa was asked to prepare and construct this document. This choice allows the company to avoid autoreferential processes, ensuring a scientific and rigorous approach to the issues of sustainability and the final results.
In particular, the reporting process directly involved the company's top management, in the person of its Director, as well as key individuals in the corporate structure, who helped identify the priority areas for reporting, the issues related to sustainability and the final data to be included in this document.
The whole process of interviewing, data collection and drafting the report took about one quarter.

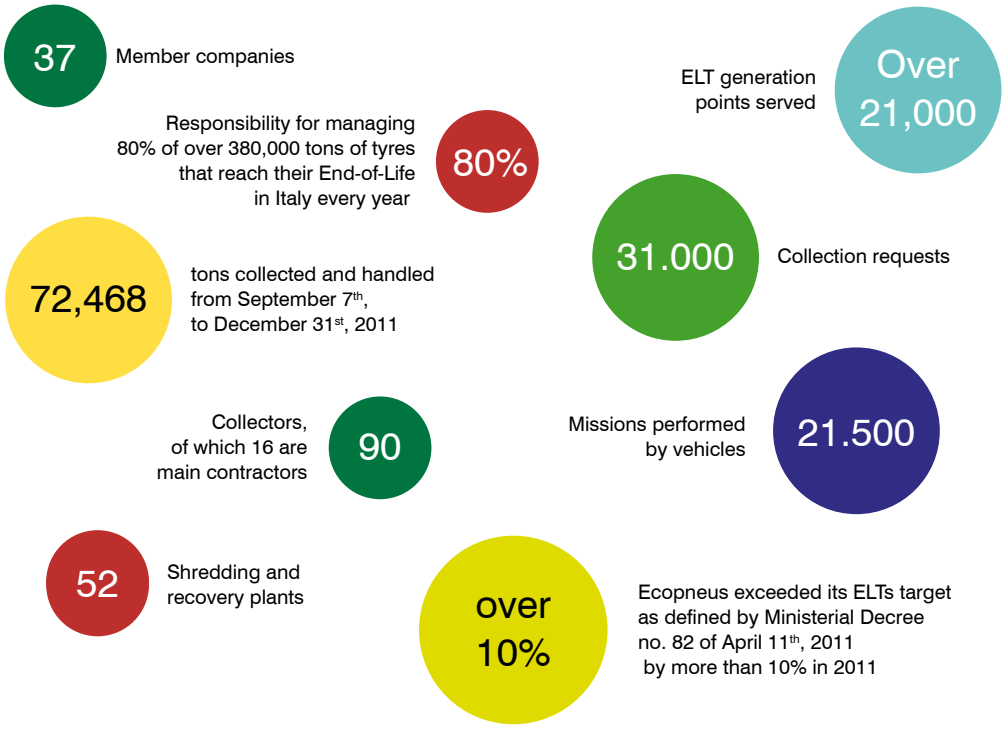


Ecopneus and the recovery of End-of-Life tyres (ELTs)

Ecopneus and the recovery of End-of-Life tyres (ELTs)

This first part of the document gives a "snapshot" of Ecopneus, with some of the most significant figures for 2011. It describes some background elements, including a clarification of the company's purpose, End-of-Life tyres.
It then outlines the regulatory framework, both in terms of extended producer responsibility in ELT management, and in terms of environmental fees paid by consumers to support the proper disposal of End-of-Life tyres.

Img. 2
Ecopneus' system in numbers: overall picture at the end of 2011



Finally, it describes the chain, the network of operators who are directly involved in ELT management, from their generation up to their recovery or recycle.

The regulatory framework and extended producer responsibility

As of April 29th, 2006, the date of entry into force of **Article 228 of Legislative Decree no. 152 (Environmental Code) of April 3rd, 2006**, "End-of-Life tyres" are now officially among the "special categories of waste" for which parliament has seen fit to dictate a specific discipline. In particular, in order to optimise the recovery of End-of-Life tyres and to reduce their manufacture through retreading, the Legislative Decree says that "*producers and importers of tyres are obliged, individually or in associated form, and at least annually, to provide for processing a number of End-of-Life tyres equal to the number they market and intend for sale within Italy*" (so-called "**extended producer responsibility**").
On **June 8th, 2011** the **"Regulations on the management of End-of-Life tyres" (Ministerial Decree no. 82 of April 11th, 2011)** was published in the Official Gazette of the Italian Republic, which pursuant to Article 228 of Legislative Decree 152/2006, set the schedule and operational procedures of the new management system. The publication of the implementing decree allowed Ecopneus to start operating from September 7th, 2011.

Environmental fees

ELTs management system is financed through so-called **environmental fees**, approved annually by the Ministry for the Environment, Land and Sea (MELS) and paid at the time of purchase of new tyres, by end users. This fee, shown in all tax documents for tyre sales and thus visible and measurable at every step, has replaced a cost that was included although not shown, for years in the price of purchase and mounting of new tyres.
The funds collected are used to cover the costs of efficient and effective management of ELTs from which no profit can be derived. In fact any surplus is transferred to operations in the following year, with at least 30% allocated to withdrawals from historic ELT stocks

End-of-Life tyres

End-of-Life tyres are not always the result of tyre replacement. There are various factors (e.g. relating to its state of wear, preparation for retreading, the desire of the holder) why Used Tyres (UT and not yet ELT) may be intended for reuse or retreading.

Tyres are defined as End-of-Life when "**having been removed from use at any point in their lives, their holder (physical or legal person), has discarded them, or has decided or is required to discard them and that are not subjected to retreading or subsequent reuse**", under Art. 2 of Ministerial Decree no. 82 of April 11th, 2011. Bicycle tyres, inner tubes, their protectors (flaps), gaskets, rubber tyres for airplanes, solid tyres and rubber tracks are excluded.

throughout Italy, with the aim of contributing to the removal of many abusive deposits. As you can see in the table below, **the fees from January 1st, 2011 were lower** than those for the previous year, with further reductions in the month of May for some segments of band D. Indeed, **operational efficiency in 2011 made this reduction possible** to the benefit of end users.
There are special rules for **tyres from vehicles dismantled at the end of life**, which can involve producers/importers of tyres "as an alternative to other authorized entities to ensure greater economic competitiveness", through agreements with the ACI Management Committee for ELTs from out of use vehicles for the collection and recovery of ELTs and their relative costs. The funds for the operation will come from a special fee collected from retailers on the sale of each

Waste recovery fees

Cat.	User vehicles	Min-max weights (in Kg.)	Waste recovery fee effective 2011 (Euro/tyre)	Waste recovery fee effective from May 1st, 2012 (Euro/tyre)
A	Motorcycles (mopeds, motorcycles, three-wheelers, etc.)	A1 (2-8)	1,50	1,40
B	Motor cars and trailers (cars, light commercial vehicles, caravans, etc.)	B1 (6-18)	3,00	2,80
C	Trucks and buses (trucks and trailers, semi-trailer trucks, articuled buses, trolley buses, road tractors, etc.)	C1 (20-40) C2 (41-70)	12,10 23,50	11,80 23,10
D	Farm, multipurpose, industrial vehicles (tractors, excavators, etc.)	D0 (<4) D1 (4-20) D2 (21-40) D3 (41-70) D4 (71-110) D5 (111-190) D6 (191-300) D7 (301-450) D8 (451-700) D9 (oltre 700)	0,90 4,00 9,80 18,80 29,00 55,00 120,00 326,00	0,85 3,95 9,50 18,30 28,40 56,60 98,00 173,00 229,00 434,10

new vehicle. This fee will be paid into a fund set up at the **Automobile Club of Italy** (ACI). In this case the competent authority will decide the fee on the basis of information provided by the ELT Management Committee, which will be responsible for supervising the operation of the fund. The proceeds of the fee will ensure coverage of operating costs of ELTs collected and the Committee's management and administration costs and will be commensurate with the type of tyres to which it relates. Any surplus arising from the annual operation of the fund is reinvested in its operation the following year.

ELTs recovery chain

ELTs recovery chain can be divided into **six stages**:

1 **Generation of ELTs:** ELTs are generated following replacement of a tyre, performed in one of many tyre change centres, such as a tyre dealer or a service station.

2 **Collection**: Companies that have the necessary authorisation to

Img. 3
The ELT recovery process

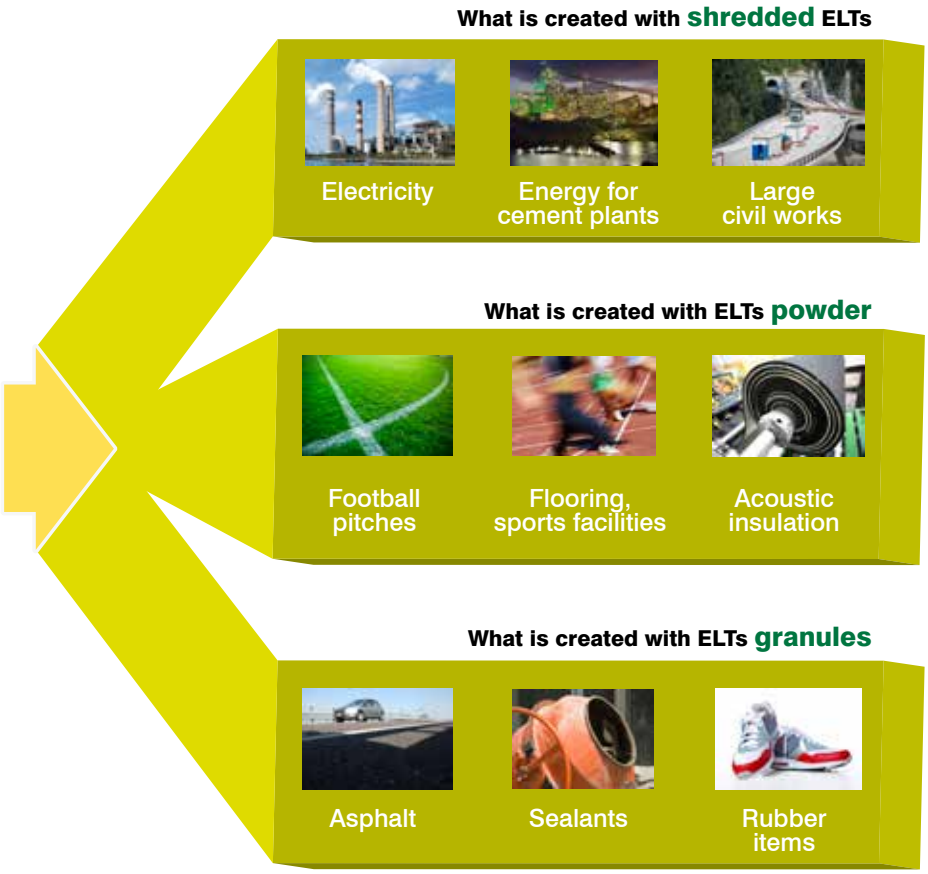
Img. 4 (next page)
The recovery process

collect ELTs from generation points and transport them to various selection and storage platforms or authorized ELT storage centres.

3 **Selection:** ELTs are thus divided into four size categories at the selection platforms: Small (S), Medium (M), Large (L), and Gigantic (X). This subdivision is very important because it aids the subsequent sorting at the shredding plants where the ELTs are processed. For example, some plants may not receive the gigantic ELTs because they don't have suitable machinery. In addition, the composition of the tyres varies to some degree according to the type and size of tyre (for example the percentage of textile fibres present), making them more or less suitable to particular types of recovery

4 **Transportation**: After having been carefully selected, the ELTs are transported by authorized companies from the authorized retention centres for storage at the shredding plants.

The recovery process



5 **Shredding** (or transformation of the waste): The shredding plants begin by mechanically reducing the volume of ELTs (so-called "shredding" producing a material ranging in size from 5 to 20 cm). This may be followed by a further reduction in size to produce via "granulation", granules or powders.

The recovery chain may close at the same time as shredding: This happens at the point when the shredding plant generates, by virtue of the type and quality of outgoing materials and authorisation received, materials no longer classified as waste but that now come under the heading of "**secondary raw materials**" [1]. Indeed, these are sold on the market and used for a variety of recycled rubber products. If the outflow from the plant is still classified as waste, ELTs chain must include the further step of recovery.

6 **Final recovery (effective recovery of waste)**: This phase includes two alternative types of activity, both capable of closing the ELT recovery cycle: Completion of the recovery of materials or energy recovery.

As we shall see later in this document, Ecopneus, interacting with different operators in the chain, ensures the coordination and an efficient and continuous recovery of ELTs.

[1] Article 181-bis of Legislative Decree 152/06 sets the criteria and conditions for a material to be considered as a **secondary raw material** and not a waste. In particular this refers to materials that may replace the corresponding virgin materials in the production cycle without causing damage to the environment and human health. However, Article 181-bis was omitted from the last update of Legislative Decree 152/06 to make room for Art. 184-ter that dictates the conditions for **end of waste**. Secondary raw materials have therefore been legislatively ratified under the new terms of Community legislation that a material must meet in order to be no longer classified as waste. The term MPS is used in the text even if it is no longer used in Italian legislation.

Processes for enhancing energy recovery

Fuel deriving from ELTs has a calorific power which is equivalent to that of pet-coke or to that of a high quality coal; for this reason it is appreciated as a substitute for fossil solid fuels, and may be exploited by industrial plants which are particularly energy-consuming, such as cement works and energy/steam production plants, paper mills, etc.

For the environmental impact, the presence of natural rubber and cellulose-derived fibres in ELTs – estimated at 27% in weight by the Ministry for the Environment and the Safeguard of Land and Sea – ensures a significant reduction in the amount of fossil CO_2 emitted by the combustion plants that use ELTs in place of fossil fuels.

The low heavy metal and sulphur content of End-of-Life Tyres, compared to traditional fossil fuels, significantly reduces the presence of these elements in the emissions, thus making the latter easier to treat and confirming the lower environmental impact of the use of ELTs.

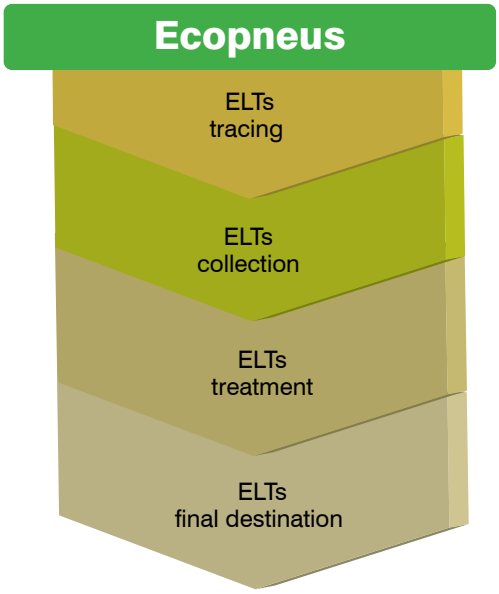
The company

The company

About Us

Ecopneus SCPA is a non-profit Limited Company for the **traceability, collection, treatment** and recovery of End-of-Life tyres (ELTs).

Established in 2009 by the six leading tyre manufacturers operating in Italy in accordance with Article 228 of Legislative Decree 152/2006, the company began operations on **September 7th, 2011**, following the enactment of Ministerial Decree no. 82 of April 11th, 2011 (implementing decree of the above-mentioned Legislative Decree) and the definition of so-called environmental fees. In the course of **2011 seventeen companies chose to transfer their responsibilities for ELT management to Ecopneus**. In fact, the six founding companies (Bridgestone, Continental, Goodyear Dunlop, Marangoni, Michelin and Pirelli) have been joined by: Driver Italia; Gexpo; Laneve Pneumatici;



Img. 5 Ecopneus' system

Parise Gomme; R.G.S. Pneumatici; River; Rossi Lamberto; Trelleborg Wheel System Italia; Union Pneus Italia; Vredestein; and Zuin[2].
To join Ecopneus, companies had to show that they possess, and are committed to maintaining, the **requirements for their business activity** (placing at least 20 tons of tyres on the replacement market in the year before their application request), and stringent **requirements of integrity**, according to which subscribers can acquire and hold their shares only if they:

(i) Are not in one of the conditions of ineligibility or disqualification under Art. 2382 of the Civil Code;
(ii) Have not been subjected to preventive measures imposed by the court under Law no. 1423 of December 27th, 1956, or Law no. 575 of May 31st, 1965, subject to the effects of rehabilitation;
(iii) Have not been convicted at first instance, subject to the effects of rehabilitation:
   a. To imprisonment for an offence under the rules governing banking, finance, securities, insurance and the rules governing markets, securities or payment instruments;
   b. To imprisonment for one of the crimes covered in Title XI of Book V of the Civil Code and in Royal Decree no. 267 of March 16th, 1942;
   c. To imprisonment for not less than one year for a crime against the public administration, against public trust, against property, against public order, against the public economy or for a tax offence;
   d. To imprisonment for a period of no less than two years for any offence committed with criminal intent;
(iv) Are not in a state of liquidation or insolvency;
(v) Have not been declared bankrupt, or subject or admitted to liquidation or bankruptcy proceedings;
(vi) Have not been subject to an application for admission to one of these proceedings (where applicable).

[2] In the first four months of 2012 thirty-eight new companies joined the body of Ecopneus' shareholders: A. R. Pneumatici, Azeta Group, B.R. Pneumatici, Bersangomme, BIS, Buymec, Catania Gomme, Commerciale Pneumatici, Crespi Gomme, Devalle Gomme, Di Pasquale Diego, Driver Servizi Retail, Fiat, Fintyre, Grassini Pneumatici, GRG Pneumatici, Harley-Davidson Italia, La Genovese Gomme, Mercedes Benz, Natale Illario, Pneus 2000, Pneus Area, Pneus Sette, Pneusmarket, Pneusmarket Alpina, Pneusmarket Friuli, Pneusmarket Romagna, Pneusmarket Verona, Pneuspergine, Pneustore, Ponente Gomme, Re-Ta Gomme, Ridolfi Idio & Figli, Solideal Italia, Spiezia Pneumatici, Tecnogomme, Univergomma, and Volkswagen Group Italia.

Start of activities: an example of efficiency

The year 2011 was a crucial one for Ecopneus.
The first six months, dominated by awaiting the emanation of the Implementing Decree and by the definition of the so-called environmental fees, were dedicated to a variety of activities necessary to enable the company to begin work.
In particular, **monitoring and registration of operators in the chain nationwide** were intensified, **developing managerial and administrative IT systems**. The **documents necessary to performing tenders and the assignment of tasks** (specifications, requests for quotations and contracts) were drawn up. This enabled Ecopneus **to start working the day immediately following the publication** by the Ministry for the Environment, Land and Sea, of the tables containing the **total environmental fees for 2011**.

Our mission

Ecopneus is responsible for managing a total of **80% of over 380,000 tons of tyres that reach the end of their lives in Italy every year**. Indeed, it is responsible for a quantity of ELTs proportional to the overall market share of its member companies.

Ecopneus' mission embraces all aspects of management of the system of tracing, collection, treatment and recovery of ELTs. In particular, Ecopneus must:

1. **Identify all the waste-tyre generation points**. The complete mapping of all tyre dealers, service stations, workshops and, in general, the points where tyres are changed, enables the monitoring of the places where the tyres are identified as "End-of-Life". Furthermore, this mapping of collection points, will also include vehicle wreckers, on the basis of specific ad-hoc agreements;
2. **Optimise the logistical part of the system**. Ecopneus ensures that the transport of ELTs from tyre dealers, to temporary storage centres, recovery facilities - a fundamental part of the ELT chain - works in an integrated and efficient manner;
3. **Guarantee the collection process in order to supply all operators**. The flow of ELTs to be collected must be constant and guaranteed, in order to support a local economy that reflects positively on the national one;
4. **Promote new ELTs uses**. Ecopneus promotes research and development of applications that can use the materials derived from ELTs. It is also committed to disseminating information to broaden the possibilities of use in already known areas and in innovative applications;
5. **Perform monitoring and reporting**. To prevent the illegal dumping of ELTs it is important to constantly follow the flow, making each step transparent and encouraging proper reporting.

Operating principles: Ethical Code and the organisational model pursuant to Legislative Decree 231/01

During 2011, Ecopneus worked to define a **Code of Ethics**, as finally approved by the Board of Directors on January 12th, 2012. The official document contains **all rules of behaviour, values and principles** to which all directors, auditors, employees, consultants, and partners of Ecopneus must conform in the conduct of their business. The general principles of **impartiality and respect for others, responsibility and respect of law, fairness and honesty, transparency, privacy and confidentiality, priorities for the protection of health and safety of workers, fair competition and environmental sustainability**, are stated in the document with greater detail for the various types of stakeholders.

In particular, the following areas are outlined in the Code:

- **Relationships with company shareholders**: Ecopneus is committed to providing accurate, truthful and timely information to

company shareholders and within the scope of their prerogatives to improving the conditions under which they may participate in corporate decisions through the pursuit of their goals and with socially responsible management of the areas in which it operates;

- **Relations with the Institutions and Public Administration**: the assumption of obligations towards public administration and public institutions is restricted to assigned and authorized corporate functions. In relationships with this type of partner, any entity that represents Ecopneus must exercise the utmost transparency, clarity, and fairness in order not to lead to partial, false, misleading or ambiguous interpretations by the institutions with which they have various sorts of relationships;
- **Relationships with suppliers**: Ecopneus seeks maximum competitive advantage in procuring goods and services, providing equal partnership opportunities for every supplier, as well as fairness and impartiality of judgment;
- **Relationships with employees**: management of human resources is based on respect of the personality and professionalism of employees. Professional development is valued and any form of recommendation and clientilism condemned. People are to be protected in terms of equal opportunities and the absence of discrimination in the workplace is to be ensured.

The principles of the Code of Ethics, while generally applied regardless of specific regulatory requirements, are also made effective through the adoption of the **Model of organisation, management and control adopted by the Company pursuant to Legislative Decree 231/2001**, and integrated into it. Compliance with the Code of Ethics is therefore considered crucial not only for good operation, reliability, and reputation of the Company, but also to avoid any involvement of same in possible criminal behaviour by relevant corporate bodies, managers, employees and partners according to Legislative Decree 231/2001. Verification of abidance of implementation and application of the Code of Ethics falls primarily under the aegis of the General Manager and the Board of Directors. The Supervisory Committee is also a committed to this end

Ecopneus' system

From the point in time when a tyre is removed from a vehicle and can no longer guarantee safe and efficient performances, it becomes an End-of-Life tyre(ELT), thus a waste, with Ecopneus taking on a major responsibility for its management, up to final destination. Ecopneus has decided **not to make direct investments in the operational activities** of ELT management, instead working to create, by carefully selecting from among all available companies interested in acting as providers, a network of companies able to carry out the work, focusing its own efforts on just the essential functions of **coordination**

and monitoring, tracking flows and development of the uses of ELT derived materials.

Img. 6
The role of Company's system

To this end, Ecopneus has adopted a **logistic model** similar to that developed in the last five years in Spain and France by ELTs management companies under similar extended producer responsibility regimes. That management is supported by an **IT system**, whose software has been licensed from Signus - Spain's main ELTs management organisation - and adapted to Italian regulations. Operational changes have also been introduced to create a more detailed management of the chain. The IT management system allows **tracking of each kilogram of ELTs collected, processed and taken to recovery**. Ecopneus promotes **research and development of applications** that can use ELTs derived materials. Ecopneus is also committed to **disseminating information to broaden the possibilities of use** in areas that are already known and in innovative applications, such as for example: construction of soundproof barriers, erosion control barriers, slope stabilisation, coastal protection, construction of road and rail foundations, lighter road embankments and stormwater detention ponds, infill material for artificial grass football pitches, athletics tracks andshock-absorbing surfaces, construction of speed bumps, traffic bollards, and curbs, etc..

Stakeholders in Ecopneus

Stakeholders (or "interest bearers") are all those entities who are influenced, or directly or indirectly influence the activities of a company. Ecopneus considers the management of relationships with stakeholders key to achieving its strategic goals. Thus in 2011 it carried out the important task of **identifying its stakeholders**, identifying **nine macro-categories and thirty-two sub-categories**.

It thus performed information, discussion and cooperation activities and projects that established common relationships and work projects, as summarized in the table on pages 40 and 41.

With reference to stakeholders considered to be of strategic importance to the Company (Company shareholders, employees, chain operators, institutions and public administration, political, union and association representatives; mass media), Ecopneus first defined

and then formalised a number of "relational principles" in its Code of Ethics, including: **correctness, transparency and non discrimination in the management of relationships**.

In order to create a proper policy of stakeholder engagement, in 2011 Ecopneus positively and proactively managed synergies with its stakeholders, laying down the foundation for building strong and long lasting relationships over time. In particular, the Company focused its attention on a number of categories of stakeholders, conducting effective initiatives not just of information and dialogue, but also of cooperation and partnership. In order to build a strategic, systematic and conscious approach to its relationship with its stakeholders, during 2012 Ecopneus will produce a real "**stakeholder map**", namely a representation of the Company's system of relationships with its stakeholders based on the principle of relevance.

Benefits of stakeholder engagement

The effective and strategically aligned involvement of stakeholders can:

- lead to a more equitable and sustainable social development by giving to those with the right to be heard an opportunity to be involved in decision making;
- enable better risk management and enhance reputation;
- take into account all the resources (knowledge, people, finance and technology) for solving problems and achieving goals that cannot be pursued by individual organisations;
- allow an in-depth understanding of the environment in which the company operates, including market developments and the identification of new strategic opportunities;
- allow companies to learn from stakeholders, achieving results in terms of products and processes' improvements;
- inform, educate and influence stakeholders and the external environment to improve their decision-making processes and actions that have an impact on the company as well as on society;
- build trust between a company and its stakeholders.

(Krick, T., Forstater, M., Monaghan, P., and Sillanpää, M. 2005. The Stakeholder Engagement Manual Volume 2: The practitioner's handbook on stakeholder engagement. The United Nations Environment Programme and Stakeholder Research Associates, October 2005.)

Macro-category of stakeholders	Main sub-categories	Means of contact
Citizens/Consumers	• Who pays the fee as purchaser of the tyre • Who benefits from the environmental and social advantages guaranteed by Ecopneus while not directly paying the fee • consumer organisations	Website www.contributopneumatici.it; Campaign "Have you ever wondered what happens to the ELTs?" Discarded Tyre Report; Rubberized Asphalt Report; Social Networks (Facebook, YouTube, Scribd)
Collaborators	• people directly employed by Ecopneus • people employed by Ecopneus partner companies (suppliers and consultants • consultants and indirect service providers	Internal communications
Collective Community	• Environmental associations • Sports associations • Automobile Club of Italy	Website; Discarded Tyre Report; Press sheets; Trade Shows
Competitors/businesses that operate in the same sector	• Other national consortiums that manage ELTs • European consortiums that manage ELTs	Ad-hoc communications and targeted meetings
Institutions, public administrations and regulatory agencies	• Ministry for the Environment, Land and Sea • National institutions and authorities that interact with Ecopneus; -- The House and Senate committees that evaluate measures that impact upon Ecopneus - Customs Agencies - Financial Police - Forest Service - Ecological Operations Unit (N.O.E.) of the Carabinieri - Other Ministries such as Industry, Agriculture, Transportation, local authorities of the territories in which Ecopneus operates with ad hoc interventions/ projects (Ferrara city council, Turin province, etc.) - Technical agencies connected to the institutions (e.g. Institute for Protection and Environmental Research - ISPRA and Regional Environmental Protection Agency – ARPA) - European institutions dealing with issue of norms and regulations related to the sector	Website www.ecopneus.it; Website www.contributopneumatici.it; Campaign "Have you ever wondered what happens to ELTs?" Discarded Tyre Report; Rubberized Asphalt Report; Trade Shows; international symposia

Media	• National/local newspapers • Radio and TV • National/international trade magazines • Online media (websites, forums, blogs, etc.)	Website www.ecopneus.it; Website; www.contributopneumatici.it; Campaign "Have you ever wondered what happens to ELTs?" Discarded Tyre Report; Rubberized Asphalt Report; Trade Shows; press releases; press sheets; multimedia slides
Academic world and scientific community	• Universities that collaborate and special research and projects (e.g. Scuola Superiore Sant'Anna, Polytechnic of Turin, etc.) • Laboratories and testing centres • Certification centres	Website www.ecopneus.it; Discarded Tyre Report; Rubberized Asphalt Report; trade shows; international symposia
Chain operators	• Generation points (tyre dealers, service stations, garages, wreckers, etc.) • Collection companies and their associations • Shredders and their associations • Energy recoverers (cement plant) and their associations • Manufacturing companies and their associations • Asphalt companies and their associations • Companies that make football pitches and their associations • Building and construction companies and their associations	• Website www.ecopneus.it; • Discarded Tyre Report; • Rubberized Asphalt Report; • Trade shows; • Information campaign on enrolment in the system; • Welcome kit; • "100%" information campaign; • National Convention.
Tyre manufacturers and importers	• Ecopneus member companies • Companies operating in the tyre production and import sectors that are not members of Ecopneus	Internal communications

Organisational structure

Ecopneus decided to create a simple, but highly specialised structure. The **Board of Directors** (BoD) of the Company consists of six members, CEOs of the Italian branches of the six founding companies. The current members are:

- Andy DAVIES – Bridgestone;
- Alessandro DE MARTINO – Continental;
- Luca CREPACCIOLI – Goodyear Dunlop;
- Massimo DE ALESSANDRI – Marangoni;
- Jean Paul CAYLAR – Michelin;
- Alessandro D'ESTE – Pirelli.

The **Chairman of the Board of Directors** and the **General Manager** represent the company's top management, which also acts as an employer under Legislative Decree 81/2008 (implementation of Article 1 of Law no. 123 of August 3rd, 2007, concerning health and safety at work) and reports to both the Board of Directors and the Chairman. The latter is elected each year and is rotated among the founding companies of Ecopneus; Alessandro De Martino held the position in 2011, and hands it over to Andy Davies in April 2012. Giovanni Corbetta is the General Manager. As renewed at the shareholders meeting in April 2012, the BoD will remain in charge for one year. The Directors may be re-elected, and this has happened in the past, providing good stability to the Board. The Chairman is also elected every year, with no possibility of reappointment, and in rotation between the six members of the board.
The appointment of Directors remains the prerogative of the six founding shareholders - holders of B shares - the statute providing that other shareholders - holders of type A shares - do not attend shareholders' meetings, and are only entitled to sign the service contract. The six B shareholders have an equal number of shares, while the A shareholders on the decision of the Ministry of the Environment had to buy at least one share, and are subject to identical conditions: possession of one share, no right/responsibility in terms of the operation of the company, and equal contractual conditions of service. At Ecopneus – a company, as mentioned, that does not distribute dividends – Directors – representing competing companies - have agreed not to involve themselves in detailed management, providing ample power to the General Manager, with activities that are highly prescribed by the regulations on waste and strictly controlled by the Ministry of the Environment. There are also three control bodies for the specific aspects: the Board of Auditors, the Auditing Company, and the Supervisory Committee. The organisational structure also includes **Administration and Personnel, Operations and Logistics, Development of Uses and Standards, Supervision Areas** (North, Northeast, Central and South) which in turn report to the General Manager.

The activities related to **legal services, purchasing, communications and call centre**, are not carried out directly by the company, but are provided by external companies and professionals. The prospect of initiating the collection, management and recovery of ELTs, led to a significant investment this year, aimed at strengthening the operational structure of Ecopneus, with eight of the **twelve people** employed by the company (nine men and three women) being hired in 2011. Ecopneus staff is hired on a **full-time contract of indefinite duration**.

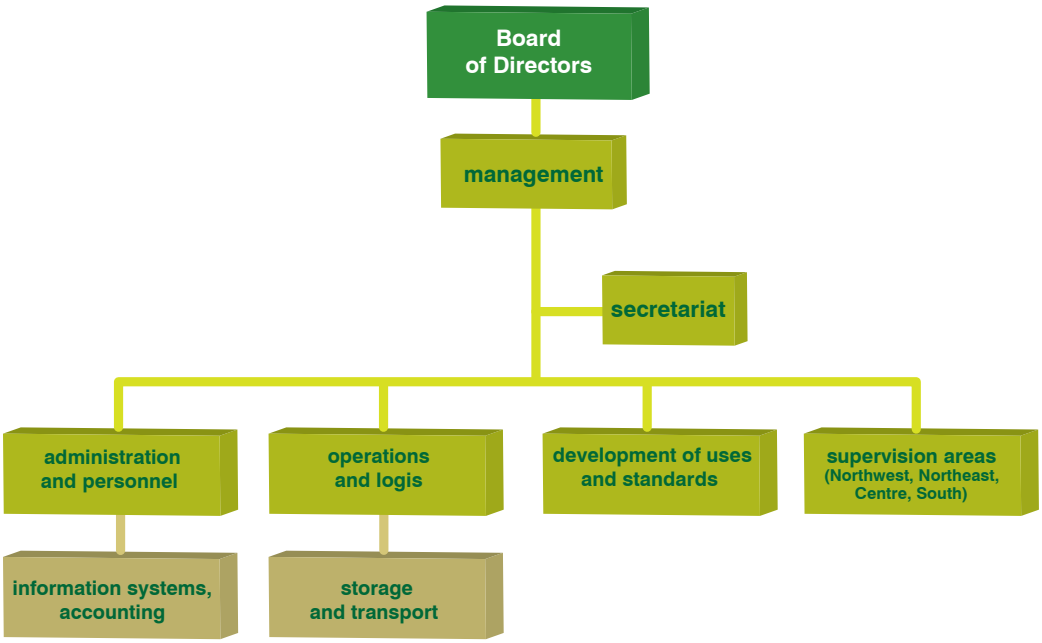
Operating results for 2011

A final balance for 2011 can only be given for the **four months when the company was operational from September 7th, until December 31st, 2011**. However, against a target of 66,453 tons, and thanks to an efficient and widespread network of partners, **72,468 tons of End-of-Life tyres have been actually collected**, 10% more than ELTs target for 2011, as defined by Ministerial Decree no. 82 of April 11th, 2011.

	2011 (1/09 – 31/12)	Legal target	Ecopneus' result
ELTs collected and sent for recovery	72.468	66.453	+10%

Given the length of the chain, from collection to actual recovery, about 40,758 tons of ELTs collected and delivered to shredding plants were shredded by December 2011. Shreds were sent for energy recovery,

Board of Directors



or as granules for material recovery. Energy recovery accounted for a greater proportion of the two recovery options. The rest of the material collected was all sent to recovery in the early months of 2012 and the economic table of p. 50 summarises, also from an economic standpoint, the completion of all activities related to the material collected in 2011.
Collection involved all Italian regions for a total of 21,539 missions (collection journeys). Table: Collection p. 46
About 40,758 tons of the ELTs collected and delivered to the shredding plants were shredded by December 2011, to obtain shreds to be sent to energy recovery or granules to be sent for material recovery. Energy recovery accounted for a greater proportion of the two recovery options. Table: ELT destination

The split between the two recovery options reflects a number of structural factors within Italy:

- The lack of interest of public administration (central and local) - the main potential buyer of ELT rubber manufactures - compared to the guidelines of Green Public Procurement and the wording of Decree 203, which wants public administration to absorb recycled products;
- The current classification of these materials as waste-derived materials complicates any authorisation procedures related to their treatment and use, and does not make them “attractive” on the market as “end of waste” products;
- The still small number of companies involved in the processing of granules and powder from ELTs for the production of manufactured goods, mainly for the construction industry, civil engineering, and sports;
- Italian stronger tradition towards the preparation of ELTs as fuel for cement plants, rather than for the production of manufactured goods, as it is easier and less demanding;
- The current economic crisis and reduced demand for raw materials and, as a result, secondary raw materials derived from recycling.

ELTs destination

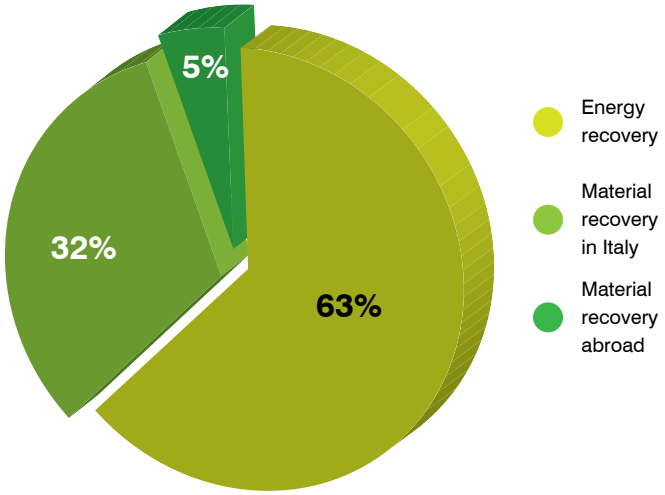
ELTs destination	Tons	Percentage
Energy Recovery	27.074	63%
Recovery of materials in Italy	13.684	32%
Recovery of materials abroad	1.965	5%

This situation has made it necessary, and will continue to do so over the next year, to allocate a substantial share of ELTs collected to energy recovery in cement plants, and to assign a marginal share of ELTs to a number of foreign plants.
This is contrary to what would be, in line with Ecopneus' wishes and strategic directions, the best and most desirable industrial policy, which would provide when fully operational:

- A recovery "portfolio" that tends to even out energy recovery and material recovery, by increasing the latter at the expense of the former;
- Recovery across the country of the total amout of ELTs collected.

Collection

Region	Quantity of ELTs collected [t] - 2011	N° missions
Abruzzo	1.880	380
Basilicata	930	230
Calabria	3.720	920
Campania	4.860	2.510
Emilia Romagna	6.340	1.346
Friuli Venezia Giulia	1.275	235
Lazio	6.281	2.085
Liguria	1.040	535
Lombardia	8.050	3.116
Marche	2.560	652
Molise	651	233
Piemonte	4.750	1.150
Puglia	4.553	1.800
Sardegna	5.030	836
Sicilia	5.530	1.120
Toscana	4.200	1.513
Trentino Alto Adige	3.102	896
Umbria	2.000	727
Valle d'Aosta	36	10
Veneto	5.680	1.245
Totale	**72.468**	**21.539**



Destination of ELTs

In terms of directly generated economic value, the activity in 2011 can be summarized as follows (amounts expressed in Euros):

REVENUES Revenues consist of environmental fees under Art. 5 of Ministerial Decree no. 82 of April 11th, 2011, paid on the amount of tyres placed on the market by shareholders	28.121.193,00
OPERATING COSTS Costs stem mainly from the collection and management of ELTs	24.279.505,01
Collection	9.201.958,37
Transportation	2.975.188,95
Shredding	5.344.814,39
Recovery	818.562,16
EU shredding	58.993,04
General expenses and costs of other activities (staff, office, external technical expertise, communication and reporting, application development)	3.573.868,10
Other (depreciation, provisions, other operating expenses)	2.306.120,00
Financial income and expenses	- 92.611,00
Taxes	1.216. 997,00
NET INCOME	2.532.079,00

Recovery targets

The **recovery target** set for manufacturers and importers by regulations for **2011** represents **25% of the quantity of tyres released for consumption in 2010**, while the ultimate target of the regulations - after an interim 80% collection and recovery in 2012 - is to pick up (from 2013 onwards) **100% of tyres that reach End-of-Life each year in Italy**, eliminating illegal and uncontrolled flows that represent a damage to environment and landscape and a serious risk to people, in the event of fire.

The funds collected were transferred to large cost centres, which relate to activities of Ecopneus, described below.
The costs of ELTs collection at waste generation points account for the most relevant item, a fact linked to the main feature of Ecopneus' system: to represent the only management system created downstream of Ministerial Decree 82/11 with **nationwide collection responsibility**, including smaller islands and mountain regions; these destinations have high transportation costs due to connection difficulties, which significantly affect the overall figure.
This is combined with the fact that Ecopneus collects and sends **all types of ELTs for recovery**, even those of large size, which have high processing costs and that can only be processed at a limited number of plants - linked to the launch of activities and collaboration with Ecopneus; deliveryto those plants further increases transportation costs. Moreover, intermediate storage of ELTs collected – included under collection costs - before sending them to material or energy recovery plants, represents an important activity for the accurate selection of ELTs and the careful and controlled management of flows. The aim is to ensure fluidity in the transit of ELTs to the recovery plant, avoiding accumulations, which may result from accidental non-programmed hold-ups or other technical problems in the plant. **Transportation** costs are linked and conditioned by the configuration of the network of processing facilities within Italy, a network that sometimes does

Old stock collection from the site at Via Ca' Rosa in Ferrara

Ferrara is the first case of withdrawal of old stock from an area entirely managed by Ecopneus' system, using the network of local operators. In addition to the management of ELTs generated by tyre replacements, the company may in exceptional circumstances also make withdrawals from old stock, when this contributes to achieving the legally required recovery and when the conditions are right for efficient recovery after collection.
The first contacts between Ferrara city council and the newly formed Ecopneus took place in September 2011, to initiate a real active partnership between the public and private sectors that will bring tangible benefits to an entire local community. Indeed last September Ecopneus showed its willingness to empty the uncontrolled deposit on Via Ca' Rosa in Ferrara, in the Diamantina small- and medium-sized enterprise zone. Eight thousand tons of landfill material had been accumulated over the years due to the bankruptcy of the company that should have recycled it.
After several site surveys and assessments by Ecopneus, an agreement was signed in October 2011. Site clearance activities began the following month and concluded in early spring 2012. The ELTs taken from the Ferrara site were allocated for the most part to energy recovery at cement plants, given the condition of the material that had been exposed to the weather for several years and was unsuitable for recovery.
The operation was performed entirely **without cost to the City Administration** since the cost tyre collection and treatment operations are borne by the Ecopneus system. The city council allocated about 80 thousand euros during the clearance operations for site safety and for rental of equipment useful in the early stages of materials' collection, a sum mainly met by Regional Civil Protection. The city council is the guarantor of controlled access to the site and of all formal requirements foreseen by the agreement with Ecopneus.

not manage to pinpoint ELTs generation sites where collection takes place. The decision of Ecopneus to use existing operators, combined with its need and choice to secure the collaboration of the best companies in terms of quality and efficiency, in some cases brings less desirable consequences in terms of transportation costs.
This company's philosophy has also guided the choice of plants for shredding activities. The desired triggering of a cycle of continuous improvement in quality and reliability of ELTs **recovery plants** in our Country, linked to the launch of activities and cooperation with Ecopneus, is creating a high quality and efficient industrial structure for the future. As for the earnings, as Ecopneus is a non-profitlimited company, they will be allocated as follows:

- 492,114 Euros to cover past losses;
- 24,000 Euros for legal reserve;
- 2,015,965 Euros, a reserve base for retained earnings, for the part not intended for the management of existing old stock (30%), according to Art. 3, paragraph 5, of Ministerial Decree 82/2011, mentioned by Art. 28.5 of the bylaws in force.

Besides representing the start of activities, 2011 was also a significant year on two other fronts:

- **external communications and public relations**: the closer the emanation of the Implementing Decree approached, the greater the attention of the various stakeholders potentially affected by the initiation of Ecopneus' activities, generating greater demand for information, explanations, feedback, and necessitating a widespread physical presence in Italy, heavy use of media, participation in relevant trade shows, and the organisation of ad hoc events;
- **development of Uses and Standards**: There have been two major strands to work on this front. On the one hand the support of the interpretation of the law in support of operations, of the evaluation and authorisation of suppliers and of the adaptation of the model to the many micro details that emerged as we came into operation. On the other hand, the constant effort to promote applications of ELTs derived material, to demonstrate their performance, to remove any misplaced "fear" of ELTs and their derived material. Focus was maintained on the development and consolidation of uses of greater impact, applications with high consumption of granules and powder, and at the same time, of increased benefit for the individual and the community: products such as modified asphalt with the addition of powder, sports surfaces and road safety manufactures, but also components for sound insulation, and waterproof membranes. Equal attention has been devoted to finding solutions for the recovery of metal and textile pieces derived from tyre shredding, in order to achieve 100% effective

recovery of materials, eliminating any use of landfill.
Ecopneus has invested heavily on both fronts, in terms of economic and financial resources, and research and investment of its human resources.

Communication activities

Communication activities are outsourced to the Rome office of Hill&Knowlton Strategies.
During 2011, Ecopneus initiated relationships and fostered an open and transparent dialogue with all those affected by the regulatory change and the new management system: central and local authorities, business associations, targeted and industry related federations, consumer groups, environmental organisations, journalists, companies in the sector, and public opinion in general. The issues of environmental protection and the potential use of ELTs and derivatives have played a crucial role in Ecopneus' communications. Issues virtually absent from the Italian media, such as the problems of discarded tyres, the new national system for ELT management and the associated environmental fee, have achieved far greater visibility mainly due to 500 newspaper articles published in 2011, but also thanks to the creation of a dedicated website.
Despite ELT generation points being among the most elusive targets to reach – as there are so many of them, they are spread across regions and are not mapped by trade associations – ad hoc actions have been formulated to inform them of the initiation of the new management system. In addition to targeted ADV campaigns in the trade press and attendance to events for tyre replacement companies (Autopromotec and Ecomondo trade fairs, meetings with organisations representing the industry), personalized printed communications were sent to all mapped activities to tell them that ELTs regulations were changing, and that by registering with Ecopneus they could use free ELTs collection service. Companies that, under various headings, could be affected by the new system (transportation, storage, shredding, and recovery) have been kept constantly informed about Ecopneus' activities . A convention was held in Rome for companies that won a tender with Ecopneus to promote the development of synergies between the various operators and convey the message that we are all part of a team, in which from each one's work depends everybody's final result , and the achievement of ambitious defined targets.

Ecopneus on the web - The website www.ecopneus.it is the main channel of communication between Ecopneus and anyone seeking information about End-of-Life tyres, acting as a meeting point for the whole chain.
There were 237,977 hits on Ecopneus' site from January 1st,to December 20th, 2011, with over one million page views. The professional orientation of the corporate website and the need to inform the general public about the introduction and aims of the environmental fee related to the purchase of new tyres, led to the creation of a second website, www. contributopneumatici.it, primarily intended for consumers/ members of the public who would like more information. Launched on September 12th, it transposes the advertising campaign "Have you ever wondered what happens to ELTs?" onto the world wide web. It was set up in collaboration with Adiconsum, Assoutenti, and the Citizen's Defence Movement and has received 8,136 hits in just over three months of activity. Facebook and YouTube were also deemed strategically useful tools, so there are now Ecopneus profiles for content and messages to be transmitted. Ecopneus' channel on YouTube has created a sort of archive open to all dealing with the main issues connected to the management and recovery of End-of-Life tyres. The six videos uploaded into Ecopneus' channel from June 7th to December 31st, 2011, have been viewed 2,092 times in total. Ecopneus' profile on Facebook was created on September14th, 2011, in correspondence with increased media coverage and resulting in public concern about the issue of "fee/new management of ELTs". Ecopneus is also present on Scribd, a portal that allows documents to be freely shared and included in a kind of "multimedia book series." The material available, the same in the website, is all included in a single page, available to anyone interested, and can be easily downloaded with one click.

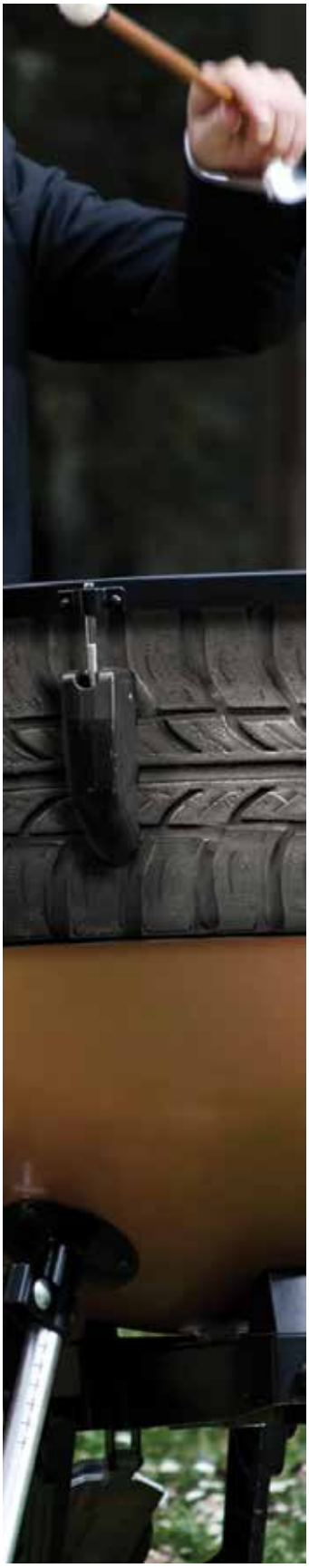
Meetings, conferences, workshops, exhibitions - In April a meeting took place in Rome between Ecopneus and other organisations responsible for the management of ELTs in France, Spain and Portugal. The meeting was one of a series of regular meetings among the four, which are held alternately in the different countries.

Autopromotec, International Biennial Exhibition of Automotive Equipment and Aftermarket Products, held May 25th-29th, 2011 in Bologna, was Ecopneus' first major testting ground with operators in the tyre replacement market. The event was specifically aimed at car and motorcycle spare parts companies, and therefore at all garages, tyre dealers, service stations and vehicle wreckers. This is the same target that Ecopneus had long since begun to involve, by registering them on its website, almost a year before the launch of collection activities. Ecopneus was present with its own stand and a conference focussed on the launch of the ELT management system, to which more than 200 people were given advance accreditation.

Sardegna Symposium 2011. Ecopneus attended the XIII International Waste Management and Landfill Symposium in Santa Margherita di Pula, Cagliari province, Sardegna from October 3rd through 7th, 2011. More than 750 delegates from over 63 countries attended the symposium. During the session on ELTs and rubber waste management, Ecopneus exposed, as speaker, to an international audience a presentation illustrating the benefits of the introduction of Producer Responsibility in the management of ELTs in Italy.

Ecomondo. Rimini's Ecomondo Fair is Ecopneus' most important public event of the year. In 2011, bolstered by the enactment of the Decree and the launch of the system, Ecopneus highlighted its presence, expanding the exhibition space and holding a conference at which most of the industry associations were invited to speak. The stand was a point of reference for the whole world of End-of-Life tyres and especially for member companies. The stand was equipped with a touch screen and interactive map, so visitors could learn about the companies within the Ecopneus management system and their distribution across Italy. The device was located in a separate "multimedia area", with a panel explaining the whole ELTs recovery process, from the point of generation to the destinations for energy and material recovery. However, Ecopneus' entire presence at the trade fair revolved around the conference that mapped out a preliminary assessment of the launch of ELTs collection and recovery system, pointing out synergies for the development of an End-of-Life tyre recycling economy. About 400 people attended the event with all entities affected by the recent regulatory change - Confartigianato, Confcommercio, Federazione Gomma Plastica, and Federazione Autonoma Benzinai - who exchanged their views on the system, current criticalities and future developments. The second part was dominated by the themes of Green Public Procurement and the need to develop a solid market for ELT derived products. Ecosistemi, the Province of Turin, and the CONSIP and UISP purchasing department for public administration spoke on this theme.

Media - Ecopneus appeared in the major magazines and newspapers with two distinct campaigns for the launch of its system. It chose to run two separate press campaigns partly overlapping in time, due to the need to communicate key messages to two distinct and essential audiences: firstly, an "institutional" advertising campaign, mainly addressed to stakeholders to bring attention to the launch of the system and the presence of Ecopneus, and secondly the introduction of the environmental fee, a campaign aimed at consumers and the general public. The "consumer" campaign was produced in association with three consumer groups, Adiconsum, Assoutenti and the Citizen's Defence Movement, who shared the inspiration of the legislature for better consumer protection and Ecopneus' desire to provide people with highly transparent and clear information. As mentioned, along with the ADV campaign the website www.contributopneumatici.it explains in clear and understandable terms why the environmental fee is required and what changes for consumers. The two campaigns in support of the launch of Ecopneus' operational activities involved daily, weekly, online, monthly and specialist publications. Ecopneus Press Office issued 528 releases in 2011.



The chain

The chain

Mapping Ecopneus' chain and creating a cooperative system

In the months preceeding the enforcement of Ministerial Decree no. 82 of April 11th, 2011, Ecopneus thoroughly analysed chain operators nationwide. The survey brought out a number of key features, including:

- presence of a significant **number of operators in each of the segments of the chain** (collection and transportation, shredding/recovery);
- **distribution of operators that could ensure local collection and treatment**, without excessive travel to other sites.

Italy has **more than 7,000 companies authorized to collect and transport ELTs** (over 70% of these companies are registered in the Environmental Managers List for quantities of less than 3,000 tons per year, in which the ELT is an authorized waste). In the field of **shredding**, before the enforcement of the extended producer responsibility system, there were a growing number of plants (more than 90), representing a **treatment capacity well in excess of the quantities actually handled** (many plants were feeling the effects of the disposal of tyres via illegal or little known channels). Moreover, there was an imbalance between ELTs generated and authorized **treatment capacity as the total authorized capacity exceeded real needs**. These findings, along with the option of channelling its energy into the management, monitoring, and tracking of ELTs flows, and incentive of the different recovery alternatives, led Ecopneus to decide from the **outset not to perform operational activities directly**. This gave the opportunity not to be in competition with other operators, but instead, was able to focus on **cooperation with companies already operating in the ELTs chain in Italy**. The **various companies in the chain** are thus **very important partners** for Ecopneus in the efficient and effective management of the entire ELTs recovery cycle.

Identification of ELTs generators

Generation points were requested by various means to register Ecopneus' website by providing their details, including: busi-

ness metrics, documentation on the quantities of ELTs sent for recycling over the previous three years, names of collection and transportation operators, amount of ELTs usually held in stock and arrangements for making them available.

Selection of operators

The selection of "Ecopneus System" operators for collection, storage, transportation, shredding and recovery was made via three different tenders:

1. Collection/Storage/Transportation;
2. Shredding
3. Recovery

Tenders were preceded by expressions of interest from local companies, more than 400 of which have registered in the Suppliers List. These companies participated in the tenders, which selected operators in the chain for the year 2011/2012.

Tenders took place entirely on an electronic platform. Management of the Suppliers List and the subsequent computerized tender was, in fact, performed by I-faber, a Unicredit Group company that specialises in e-procurement, to guarantee the necessary standards of impartiality, professionalism and confidentiality, as well as speed and operational efficiency. All invited companies were given personalized and private access to the e-procurement portal containing tender documents, tender specifications and instructions to enable everyone to submit their financial offer, in total security and confidentiality. Indeed, the

Chain's actors

ELTs recovery chain includes companies with very different characteristics depending on the segment of the chain in which they operate. In detail:

ELTs generation points - Tyre-waste can be generated at a wide range of generation points, of which there are over 30,000 in Italy including:
- Specialized tyre retailers (tyre dealers)
- Garages
- Service stations
- Premises of public and private fleets
- Wreckers

Tyres are mostly changed by small- and medium-sized companies.

Collection/storage/transportation operators – In this case as well they are mostly small companies with limited collection capacity (less than 3,000 tons of ELTs collected per year), with some exceptions represented by the larger companies in the sector. Operators in this segment of the chain don't "handle" the ELT waste but just perform collection, storage and subsequent delivery to the treatment plants.
Companies operating in this sector are increasingly and significantly diversifying their waste collection activities. Usually, in fact, companies engaged in ELTs collection possess permits that allow them to work with very diverse categories of waste, of which ELTs not always represent major share.

Shredding operators – The vast majority of shredding companies are micro-sized (turnover of under 2 million euros per year) and small (turnover between 2 and 10 million) and generally with less than 10 employees. The greater propensity of the Italian ELT market to energy rather than material recovery (much of which at foreign plants) is reflected in the fact that shredding plants mainly produce shreds for use as fuel in industrial plants. The very small size of these

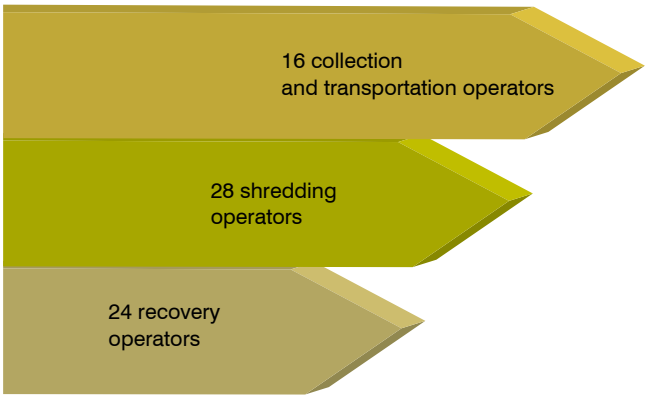
details are only visible to tenderer and Ecopneus. There were three separate rounds for each tender in 2011-2012 to properly assess the technical/economic characteristics of bidders. This allowed Ecopneus to restrict the shortlist to the best-qualified candidates, thus assisting selection and assignment.
After meeting the trade associations, Ecopneus also produced a table containing benchmarks to be used as the main guideline in pre-selection of companies to invite to the computerised tenders. These criteria (which appear to be very limiting) were extremely important and useful because they enabled the selection of companies with the best features from:

- technical point of view;
- qualifying point of view;
- authorization point of view.

The most important criteria include those relating to the guaranteed result (quantity of waste handled, size of the collection areas, and quantity of material sold/recovered) and company potential (organisational and managerial capacity, condition and capacity of facilities, availability of resources and storage areas, and financial capacity), as well as criteria for economic optimization, authorization procedures, and the development potential of the application markets downstream of recycling. A total of **68 operators were selected via the tendering procedures, respectively: 16 for collection and transportation, 28 for shredding, and 24 for recovery.**

companies has helped creating this structure, limiting the possibility of bottom-up development of innovative technologies and recovery options for materials. Most of the plants just produce homogeneous sized pieces suitable for energy recovery, simply performing bead removing, an operation required for the removal of bead ring, and shredding.

Recovery operators – The type of companies in this segment of the chain is very different, ranging (for example) from a small comapny that manufactures granules to a large multinational group, headquartered in Italy, whose output is used for energy.
ELTs-derived fuel is in fact particularly appreciated for its high calorific value and lower emissions than traditional coal and pet coke. Among various firing options presented above, the one that seems to offer the most advantages and is the most widely practised in Italy is combustion in cement works where:
- Co-combustion of ELTs can reduce emissions of NOx, SO_2, and dioxins/furans in gas emissions;
- high temperatures (>1400°C) used for the production of clinker lend themselves to the total combustion of tyres;
- iron and other heavy metals contained in tyre can be integrated within the final product;
- it is possible to achieve total recovery, also incorporating ashes in the structure of clinker;
- it obtains a reduction of CO_2, given the biomass content of the ELT (27%). The possibility of vertical integration of the different segments of the chain varies depending on the type of recovery performed. The best chances of integration are for:
- collection and shredding;
- shredding and material recovery operations.
However, in case of energy recovery, there are no cases of integration upstream.



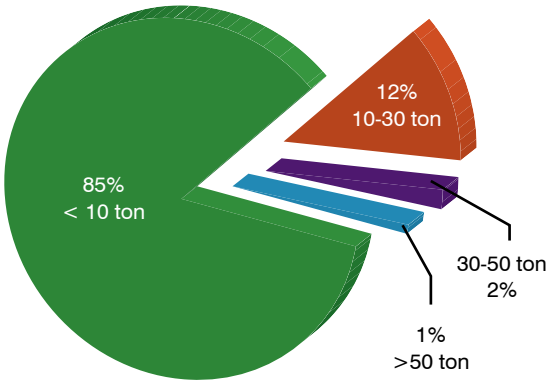
At the end of the negotiation process Ecopneus drew up service contracts with the winners.
The contracts used for collection and shredding have a standard structure, to avoid discrimination and/or favouritism between different operators in the chain. The only change to these contracts is the attachments, which now give more detail about a number of operational and/or economic aspects. A more detailed contract structure has been chosen for energy recovery, which includes a framework agreement between Ecopneus and the holding or parent company, which is then followed by different operating contracts between the operator and the plant of waste final destination. This contractual structure makes for great flexibility and allows Ecopneus to alternate, replace, and add various operators who ensure the final plants a continuous power supply.

Actors in "Ecopneus' system"

There are more than 21,000 (as of January 2012) ELTs generation points that have decided to benefit from the collection services, by registering in the Company website.
Once registered, generation points - electronically submitting a "Collection request" and after accepting the "ELT collection regulations" – benefit from the free collection of ELTs.
Once registered into Ecopneus' computer system, the "Collection Request" is seen by the operator responsible for regional collection activities. This operator organises the collection of the ELTs in the time and manner specified in the contract with Ecopneus. The collection can be completed directly by the regional collector or by a subcontractor of the same.

Of the over 21,000 ELTs generation points registered, 12,121 have actually experienced the functioning of the new system, forwarding at least one "Collection Request". Overall, more than 31,000 requests were handled during 2011.

The distribution of ELTs generating companies is uniform throughout the country and is characterised predominantly (86%) by companies that - in 2011 - delivered less than 10 tons of End-of-Life tyres to Ecopneus.



Categories of companies by amount of ELTs delivered to Ecopneus from September to December 2011

From the values shown in the following tables, the small and medium size of Italian companies seems to be reflected in tyre replacement sector. Over 10,000 replacement centres generated an average of five ELTs per day from September 7th to December 31st, 2011. Only 3 percent of companies generated more than 30 tons of ELTs in Q3 2011. However, the total amount of ELTs generated by these companies represents 24% of the total collected by Ecopneus. About 12

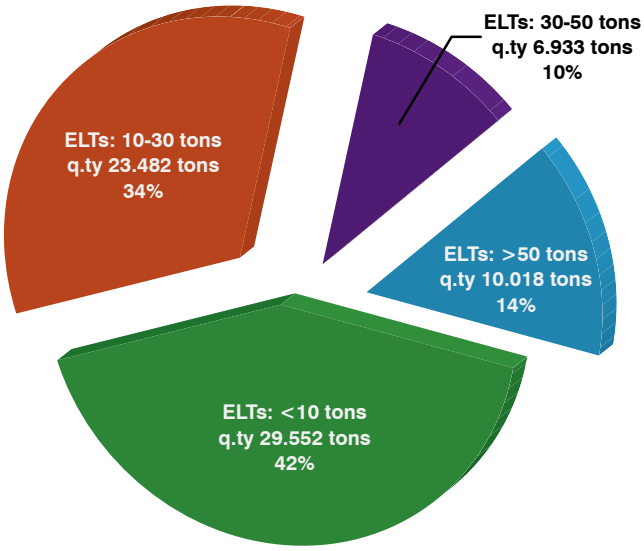
ELTs collection regulations

Collection methods are defined in the "ELT collection regulations", issued by Ecopneus and that ELT generators are required to respect in order to have access to the free collection services. The regulations define in detail what, how, how much and when about collection. Indeed they establish:

- **The object of collection** (whole End-Of-Use tyres, even if torn or damaged) and the condition in which ELTs must be to be eligible for the collection service (they must be free of contamination from oils, grease and other contaminants and free of rims and other accessories);
- **The minimum quantities to be picked up**. Collection takes place for minimum quantities that are determined depending on the type of tyre (small, medium, large and extra) and the number of inhabitants of the town where the generation point is located;
- **Response time**. Collection is guaranteed to the operator of the ELT generation point within five working days from the time the request enters the computer system in the case of towns with more than 20,000 inhabitants and within ten working days in other cases;
- **The procedures for activating** collection in each case. These refer to the use of a dedicated internet site, or if this is not possible, a fax number;
- **The procedures for storage and collection**, to facilitate the collection operation by the collection operators.

percent of companies are in the intermediate band of ELTs delivered (10 to 30 tons), but they generate 34% of the total number of End-of-Life tyres collected.

Quantity of ELTs delivered to Ecopneus from September to December 2011 by business category



ELTs collection is guaranteed throughout Italy by a network of collection and storage operators comprising companies that have won Ecopneus' tender, and their subcontractors. Indeed, depending on the size of reference areas many of these companies rely on a varying number of subcontractors. Ecopneus allows its operator partners just one level of subcontracting. Subcontractors must meet the same requirements as the partner companies to enter the tender. An overview of the collection areas and corresponding companies is described in the table below. Companies responsible for carrying out the collection and storage of ELTs at the treatment plants are medium-, small- and micro-sized companies. There is a slight prevalence of medium-sized companies (with turnover exceeding 10 million euros).
Companies authorized to collect waste generally do not deal exclusively with one type of waste, but differentiate their field of activity with permits to collect different categories of waste. Thus employees and turnover are not just linked to the collection of ELTs. In total, there are 810 employees, a large proportion of which are drivers (almost 50% of employees) and total turnover came close to 170 million euros in 2010.

As mentioned the figures do not just relate to ELT related activities.

Overall, about 7% of total revenue derives from their collection. In larger companies in particular this figure rarely exceeds 10% of total turnover, while among the smaller companies there are some that mainly or exclusively deal with ELTs. With regard to shredding, the location of the 28 companies selected is such as to ensure similar treatment capacity nationwide (also including the larger islands). The companies are predominantly small and very small, rarely exceeding 10-15 employees and a 10 million euros turnover. Similarly to collection companies, the larger firms also have more diversified activities in ELT management related services (for example integrating the business of collecting or enhancing) or environmental services in general and so their revenue does not just derive from ELT management. In 2010 Ecopneus shredding companies exceeded 100 million euros in turnover, of which almost 20% derived from ELT activities. More than 500 staff is employed by 28 shredding companies, mainly performing technical-operational tasks at the plants. The reco-

Overview of the collection areas

Companies	Number of subcontractors	Collection areas
ALBATROS Ecologia Ambiente Sicurezza Soc. Cons. a	8	Abruzzo ed Emilia Romagna
Bra servizi S.r.l.	2	Piemonte, Valle d'Aosta, Liguria
Cavallari S.r.l.	2	Marche
Ciulla S.r.l.	3	Sicilia
Dife Srl	11	Toscana e Northwestern Umbria
Ecoservice S.r.l.	-	Northern Sardegna
F.D.G. di Collu S.r.l.	-	Southern Sardegna
F.lli Santini S.r.l.	1	Trentino Alto Adige
Geos Environment S.r.l.	6	Campania and Basilicata
Nappi sud servizi	-	Molise
Salvaguardia Ambientale S.p.A.	2	Calabria
Serveco S.r.l.	11	Puglia
Settentrionale Trasporti S.p.A.	6	Friuli Venezia Giulia and Veneto
Sineri Tommaso	-	Sicilia
Centro Rottami Srl	5	Lazio and Southeastern Umbria
Venanzieffe srl con Unico Socio	9	Lombardia

very companies include the larger operators in the chain. This is explained, particularly in the case of energy recovery from ELT shreds, by the presence of large industrial groups who use ELT derived fuels in their production processes in place of conventional fuels. It is mainly small- and micro-sized companies that recover material from ELTs. They had an overall turnover of nearly 60 million euros in 2010.

Optimisation of the logistics system

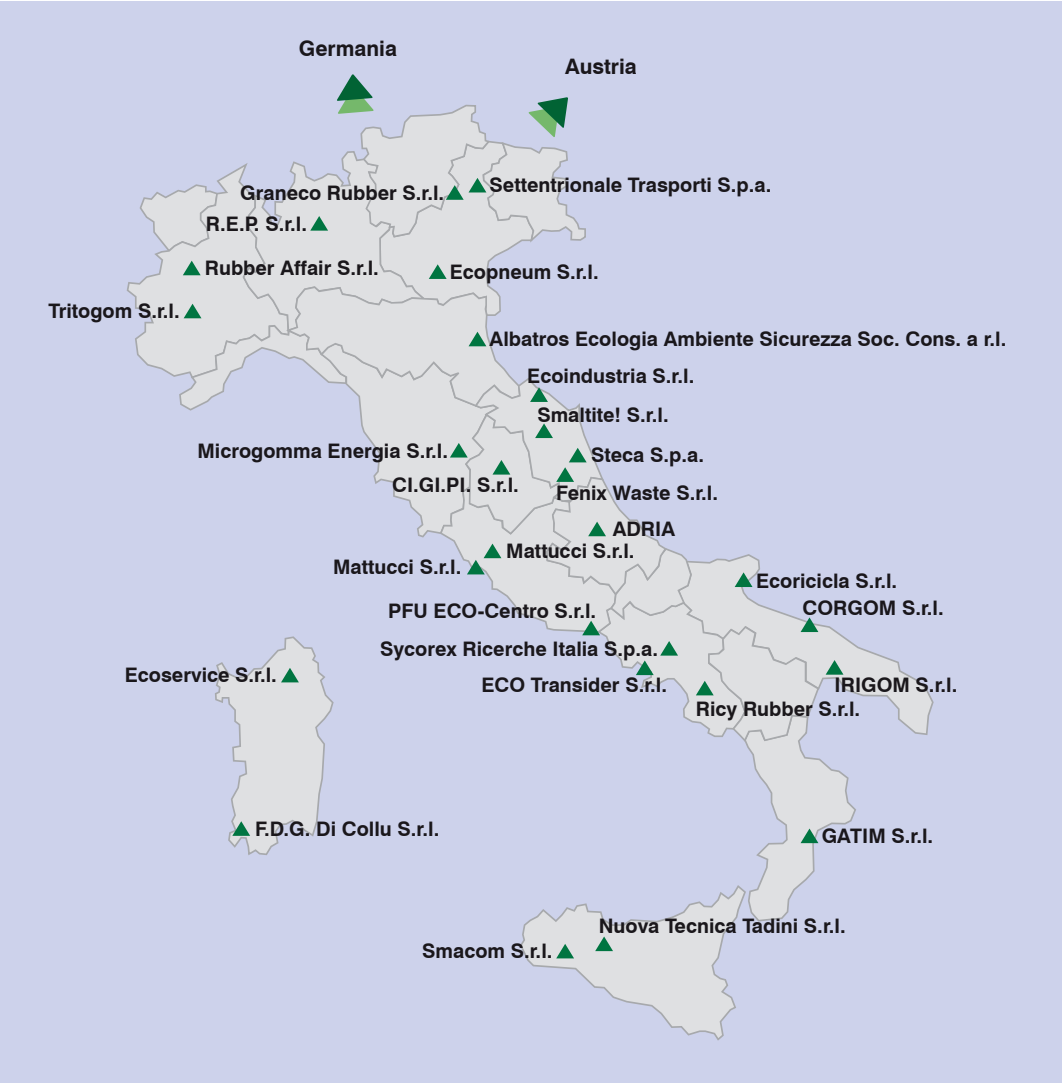
In principle, in a logic of proximity, Ecopneus' system favours, , the delivery of ELTs to shredding centres within the same region where they are collected. After four months of activities in 2011, the amount

Geographical location of collection companies

distributed at regional level is that shown in the table. Table: amount distributed at a regional level page 69

A symmetry between the amount collected and shredded within the regional boundaries occurs, for example, in Sardegna, where the two selected collection companies (one for the North and the other for the South) are also shredding companies and directly process the ELTs collected. The contrary is the case of Lombardia, where the quantity collected is mainly handled in facilities outside the region. The Marche and Veneto handle more than the quantity collected in their respective territories. This distribution relates in part to regional treatment capacity, which varies according to the

Geographical location of shredding companies



number and capacity of the selected operators, and in part to the fact that, especially during the first months of operation, Ecopneus has had to cope with emergencies and in any case with very variable situations. Indeed, the plants have not always proved really capable of treatment the quantities agreed during the tenders, due to the presence of previously stored ELTs. This has made it necessary to feed the plants with different quantities to those expected (in some cases higher, in others lower). Of course this also had an impact on the distances travelled for the delivery of ELTs from the authorized centres to storage at shredding centres. Table: Impact on distances travelled p. 70
The figure for Valle d'Aosta is connected to the absence of collection centres in the region. Sardegna has the great advantage of collection and shredding being performed by the same companies, so it is not necessary to move the ELTs from authorized storage centres to shredding centres. Conversely, Veneto, Piemonte, Lombardia and Toscana (in descending order) are the regions where ELTs have to travel the longest distances. Authorized storage centres in the Veneto and Piemonte transport whole ELTs to foreign plants to ensure their effective recovery. These extra-regional exports account for the greater distances covered by the authorized storage centres in Lombardia and Toscana, and this is due to the treatment capacity of shredding companies in Lombardia and Toscana has proved lower than the quantities collected, requiring transportation to plants in the Marche, in the case of Toscana, and Veneto, in the case of Lombardia.
In order to ensure the transport of ELTs from tyre dealers to temporary storage centres to recovery plants functions in an integrated and efficient manner, Ecopneus has a sophisticated IT system that ensures the complete traceability of ELTs up to their delivery to the recovery plants. This allows the company not only to completely monitor the flows, but also to continue experimenting with better solutions in terms of the efficiency of the logistics system, which can also minimize environmental impacts. Indeed, one of the aims of Ecopneus is to achieve greater balance and optimisation of the distances travelled by ELTs during the recovery cycle. There are two ELT collection methods:

- manually or by polyp grab crane;
- using downloadable container.

The average weight of the load of ELTs transported to the collection centre may vary depending on the collection procedures, the means of transport used, and the capacity of each company to optimise the collection trips. This last parameter (the weighted average weight) provides an indication of logistical efficiency. We can say that the higher this value, the more efficient the transport. The table shows, by region, which forms of transport are used the most and with what

results in terms of transport efficiency. As is noted, in some regions the quantity of ELTs collected "manually" is significantly greater than the quantity collected "via container", while in other regions the opposite occurs. However, it is not a given for granted that one or the other mode of itself leads to inefficiency, detectable using the weighted averages shown in the table. The average "container" values appear to be generally higher and to vary less, but there are also cases of very efficient manual collections.

The efficiency of manual collection may depend on the vehicle used. Indeed, when possible large capacity vehicles can be used. Furthermore, the ability of the collection company to plan a trip with a "full load", optimising the journey makes a significant fee to the efficiency of manual collection. So in terms of collection, as well as verifying the number of requests processed (and whether they correspond to those reaching the computer system), Ecopneus also monitors logistical efficiency, providing ideas for possible improvements.

Amount of ELTs collected and sent to shredding plants in the region

Region	Quantity of ELTs collected [t] -2011	Quantity of ELTs delivered to shredding centres in the region
Abruzzo	1.880	1.170
Basilicata	930	0
Calabria	3.720	2.856
Campania	4.860	1.854
Emilia Romagna	6.340	1.320
Friuli Venezia Giulia	1.275	0
Lazio	6.281	3.265
Liguria	1.040	0
Lombardia	8.050	219
Marche	2.560	7.904
Molise	651	0
Piemonte	4.750	2.937
Puglia	4.553	7.338
Sardegna	5.030	5.030
Sicilia	5.530	4.284
Toscana	4.200	172
Trentino Alto Adige	3.102	0
Umbria	2.000	1.632
Valle d'Aosta	36	0
Veneto	5.680	16.288

ELTs collected and not handled in the region were transferred to neighbouring regions

Shredders

Aware of the crucial role played in the chain by the treatment stage, Ecopneus commissioned Scuola Superiore Sant'Anna of Pisa to carry out a survey to provide a better informational overview of the shredding sector within the system. At the start of the survey, between November 2011 and February 2012, email and telephone questionnaires, were sent to 27 listed shredding operators, with 23 responses received.

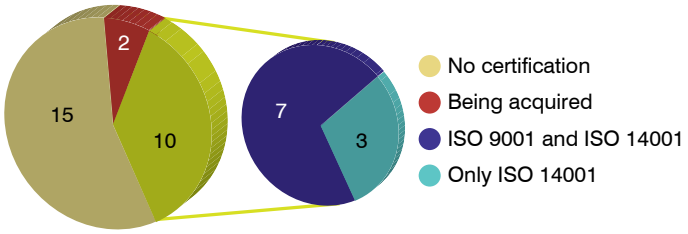
A number of general characteristics of the shredding operators emerged with particular clarity from the survey. They are, in fact, micro-sized companies followed by small ones. The only medium size ones (less than 10% of operators) are multi-service companies, which perform special waste treatment. The company size is obvious from its revenue (less than 2 million per year for over 60% of firms) and the total number of staff employed. Indeed, companies with more than 50 employees are exceptions to the rule.

Many companies have at least one environmental or quality certification, showing the attention paid to the quality of their output, the

Impact on distance travelled

Region	Weighted average distance A/R (km) from Collection Centre
Abruzzo	152
Basilicata	187
Calabria	263
Campania	280
Emilia Romagna	390
Friuli Venezia Giulia	400
Lazio	149
Liguria	335
Lombardia	496
Marche	200
Molise	225
Piemonte	593
Puglia	232
Sardegna	0
Sicilia	224
Toscana	445
Trentino Alto Adige	170
Umbria	152
Valle d'Aosta	0
Veneto	701

production process, and to improving their environmental performance. Among the certifications, ISO 14001 is more widespread than ISO 9001, showing that companies in the sector are aware of the potential impact of their production processes on various aspects of the environment and have, for some time, embarked on a path that, by implementing an effective system of environmental management, aims at achieving environmental objectives.



Quality and/or environmental certifications

Mode and volume of collection by region

Region	Quantity container collection in 2011 (tons)	Average weight for missions with container (tons)	Quantity manual collection in 2011 (tons)	Average weight for missions with manual collection (tons)
Abruzzo	234	5,44	1.646	6,7
Basilicata	75	4,19	855	5,3
Calabria	79	5,50	3.641	5,5
Campania	184	4,62	4.676	2,5
Emilia Romagna	839	4,27	5.501	4,4
Friuli Venezia Giulia	217	5,45	1.058	6,4
Lazio	558	5,14	5.723	3,8
Liguria	259	4,35	781	4,6
Lombardia	1.426	3,59	6.624	3,2
Marche	489	4,16	2.071	5,2
Molise	25	4,40	626	3,9
Piemonte	982	5,09	3.768	4,3
Puglia	230	5,18	4.323	3,4
Sardegna	20	3,36	5.010	9,1
Sicilia	50	6,67	5.480	6,0
Toscana	782	4,03	3.418	3,5
Trentino Alto Adige	867	3,35	2.235	3,5
Umbria	850	8,16	1.150	2,6
Valle d'Aosta	0	0,00	36	4,3
Veneto	1.234	5,03	4.446	6,1

Shredding companies perform shredding and any subsequent granulation of ELTs, to produce energy or material. There are two sources of revenue from these activities:

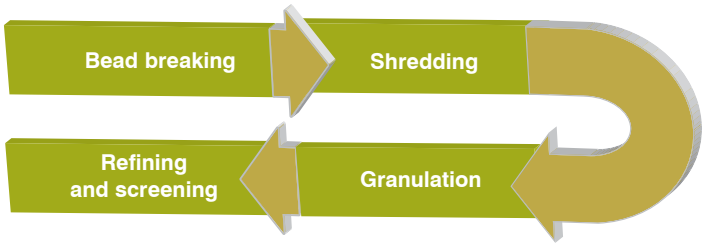
1. the first derives from the fee required upon delivery of the ELTs;
2. the second comes from the sale of products derived from shredding.

When tendering, operators participating in Ecopneus' system agreed the amount of ELTs to be treated and the relative fee per ton, while the sale of derivatives is beyond the scope of the contract made with the consortium.

The following steps are performed by an ELTs shredding plant:
1. bead removing, which is done through the removal of the metallic toroidal rings (bead rings) in tyre (usually not done on car ELTs);
2. Shredding, which produces material bigger than 2 cm;
3. Granulation (which can be primary and secondary), which reduces granules to finer sizes;
4. Refining and screening, which further refines the product, removing steel fibres and textiles contained in tyres.

The "base" set-up of a shredding plant just performs the first two steps to produce the coarser sizes, suitable for energy recovery. In the case of material recovery, more complex systems are needed and thus much bigger investments. The survey of shredding operators gave detailed information about the plant and equipment of each operator. It revealed great potential for granulation, given that almost all plants have access to a primary granulator and more than half of them also have a secondary granulation line. Some plants are also equipped with mills or pulverisers capable of producing large quantities of fine powders from ELTs.
The industry standard, which has encoded the primary and secondary products of ELT shredding, contains the following size classes:

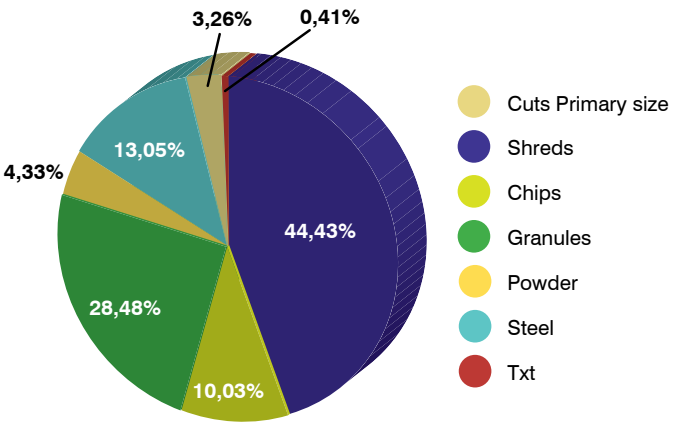
Cuts primary size	>300 mm
Shreds	20-400 mm
Chips	10-50 mm
Granules	0,8-20 mm
Powder	<0,8 mm



Stages of ELT processing in a shredding plant

ELTs are processed for energy recovery in case of rougher materials (with exceptions, for example, of the use as engineering materials in landfills) and for material recovery in case of finer materials. Chart p. 73

The chart below shows information gathered from operators during the in-depth survey conducted by the Scuola Sant'Anna and represents, for each material, the incidence of different types of processing.

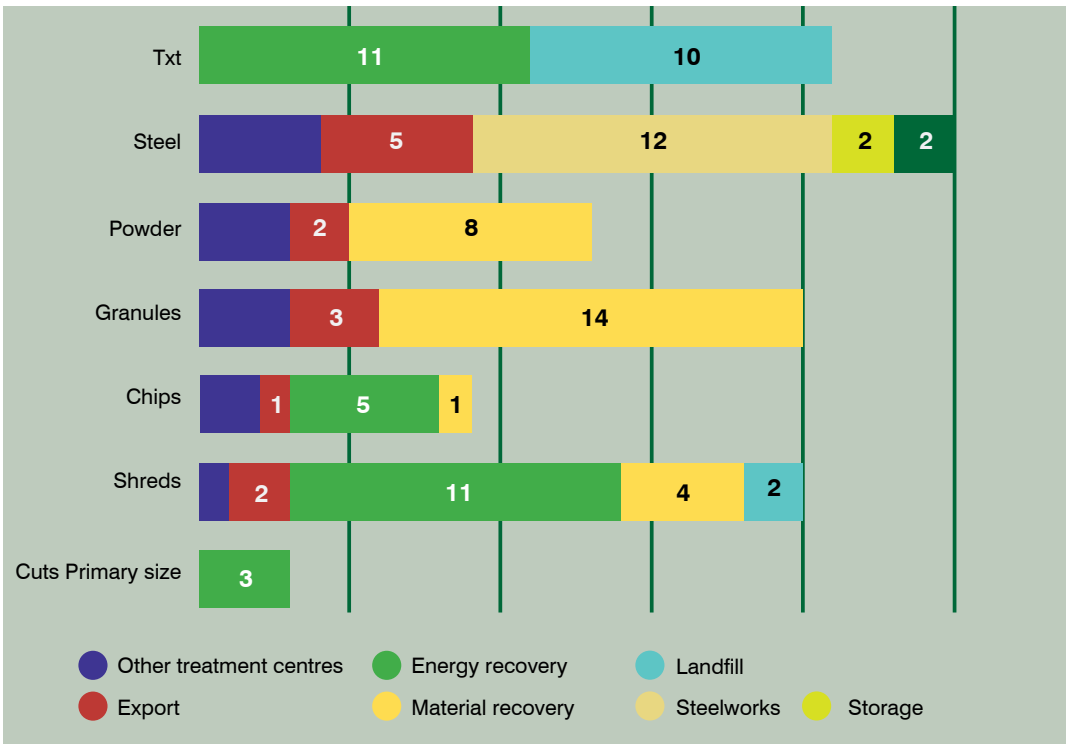


The breakdown of outflows from shredding plants according to the sample of plants involved in the survey, shows a greater propensity for energy recovery, with 45% of products made from shreds. Nevertheless, there are a significant number of granules, which constitute almost one third of the total flow. However, powder is marginal, accounting for just a small percentage of total.

The comparison between plant equipments and type and amount of material output from the plants do not always entirely tally. This is due to the historically strong preponderance of energy recovery in flows of End-of-Life tyres in Italy. Thus there was a tendency observed for some companies not to use their own plants (for

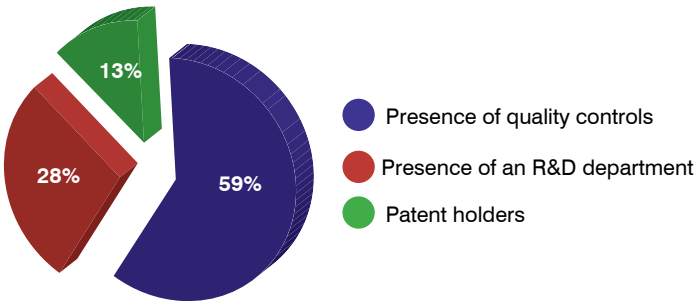
the production of granules and powders), because it is easier to market energy recovery products. The use of powder from ELTs seems particularly uncertain. In fact, powder is obtained through a pulverisation process in highly powerful and fast blades mills. This process, which enables the production of the desired quantities of powders, requires a considerably higher "base" investment. Alternatively, the granulation stage alone can obtain small quantities of powders screened downstream of granulation in order to separate different classes of granules. The great majority of plants prefer to obtain only small amounts of powders from screening carried out downstream of granulation and have not invested or, conversely although having done so, underuse that part of their set-up, to produce materials for which there may not be a buyer. Indeed powder is used in high-tech applications in the field of recovery of materials from ELTs, applications that today are still marginal in the Italian market. However, some (though not most) of the operators in Ecopneus' chain can be defined as "pulverisers", having geared their own production to obtaining powders, while others appear ready, either because of past investment, or investments they are about to make, to meet the demands of a market evolving towards a more intensive use of technology. The increased orientation of output to material recovery has increased the need for quality checks on

Destination of outgoing materials



the products. Overall, more than half of those surveyed said they perform quality checks on outgoing materials, while more than a third of the sample has a research & development department. There is a far from negligible number of patents (17% of the sample) and this is an interesting measure of the degree of innovation in the sector. Table and picture p. 74

Not all primary flows of a shredding plant (from primary size to powder) are a source of revenue, but it is quite common for even some semi-refined products to incur costs for their delivery to another plant. This happens in case of materials destined for energy recovery plants, which often request a "gate charge" (when a carrier brings the ELTs to the plant it pays a price per ton for their treatment. Shredders thus have a double-flow of revenue, receiving payment from the deliverers and the purchaser of the recovered material).



With the decrease in size of the material and consequently with the increased degree of processing required, the sale price also rises. If in the case of cuts and shreds there is a more frequent request for a collection charge at the gate, chips are processed to a level for which payment is more frequent.

Granules and powders are always sold. Sale price of powder obtained as screened waste of granules does not differ sharply from the price of granules, while that of powder obtained through a dedicated process is over three times higher, showing the remunerative potential of its production. Textile and steel fibres are among the output of a shredder. The operators' survey , however, enabled the

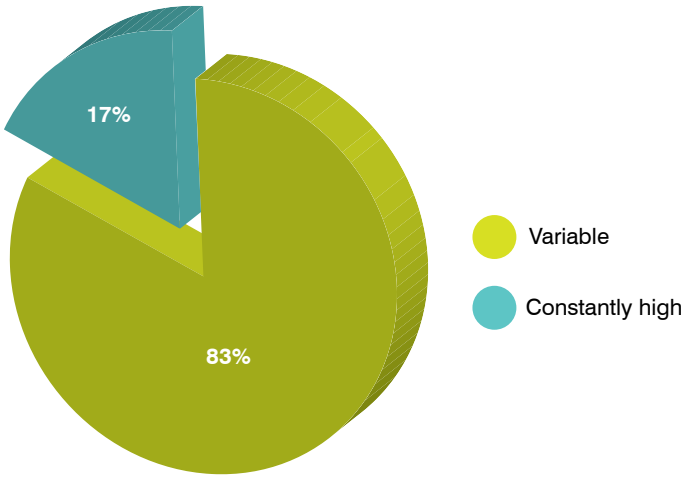
	Number of companies
With Research and Development departments	9
Patents Owners	4 (di cui 1 in fase di rilascio)
With the R&D department and patent owners	3
Powder	<0,8 mm

verification for these two materials:

1. absence of any possibility of recovery of textile fibres in Italy;
2. great variability in steel placement. .

Textile fibres that constitute the reinforcement webs in tyres are mixtures of rayon, nylon and polyesters. They are present at up to 5% in weight in car and agricultural ELTs, while these fibres are not present in other types of ELTs.. Although, by their composition, these materials lend themselves to successful use as modifiers of bitumen rheological properties, as thickeners for filtration sludge, and as materials for thermal insulating panels, there are no applications in Italy that exploit their properties. They are to all effects by-products of the production process, for which the plants bear significant disposal costs.
As far as steel is concerned, it is present as small circles and structural fibres in all tyres. Steel, separated from rubber and fibre using magnetic separators, can be reused by the steelworks in their manufacturing processes. One limitation to this derives from the presence of impurities (residual rubber or fibre) that often require intermediate clean-up steps at treatment plants. Among the operators in Ecopneus' chain, as anticipated, there has been a certain variability between possible very profitable sale to domestic and foreign steelworks and the need to transfer to treatment facilities, which conversely determines a cost. This variability is not solely attributable to fluctuations in steel price, but also to factors specific to the shredding process (such as blades maintenance) that can create a product more or less "clean" and, therefore, affect the possibility of profitable uses for the company. Part of the survey was designed to collect the assessments of operators on the availability of incoming materials, prior to joining Ecopneus' system, and on the progress of demand for products leaving the plant.

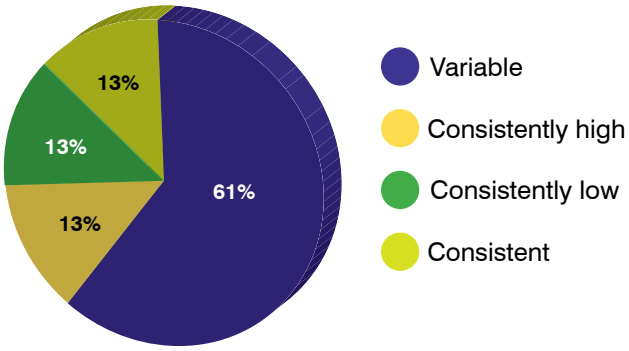
The availability of incoming materials



Regarding the assessment of the availability of incoming materials, over 80% of respondents highlighted a great variability in the availability of ELTs. This finding confirms the difficulties of many shredding plants, which emerged with a first general survey of the sector, and highlights one of the first and most obvious positive repercussions of joining Ecopneus' system: the certainty of delivery at agreed prices.

The domestic market represents the reference market for shredding operators, with a minority represented by export (usually no more than 30%). Product demand is considered very variable, although some companies judge it consistently high or consistently low.
In line with the current shape of the Italian market, the operators experiencing greater difficulty in placing their products on the market due to the low or consistent demand are those whose output is intended for material recovery. In contrast, those who reported greater ease of placement (consistently high demand) mainly produce output for energy recovery.

The demand for your products is



The elements outlined above are useful for analysing the current or potential effects of the "revolution" in the chain due to the launch of a system that has guaranteed a reliable supply of ELTs and that however may in certain aspects be more fragile due, for example, to a not always easy placement of products on the market.

Aware that effective and efficient management of ELTs recovery cycle can only be guaranteed by a deep sharing of values and aims with its partners, as well as by their professionalism, Ecopneus has always invested time and resources in order, on the one hand, to maintain a constant channel of communication and dialogue with participants in the chain of the integrated "Ecopneus System" and on the other to be an animator and facilitator of their improvement processes.
On the first front special attention has been devoted to the **generation points**. Indeed, they represent the interface with the end user,

Sharing a common project

who is asked to pay – when purchasing tyres- an economic fee that finances the entire virtuous cycle of ELTs recovery . In recent months, to ensure that tyre dealers were properly informed about the transformation sweeping over the management of ELTs at national level, special communication campaigns were conducted to convey the message of the importance of a "systems approach", and promoting their registration to the system.
Regarding the commitment of Ecopneus to act as stimulator and facilitator of processes of improvement of the operators, it should be noted that in November 2011 the company Certiquality of Milan is conducting audits of operators on behalf of Ecopneus.

The audits are focused in particular on aspects such as:

- Possession and maintenance of the legally stipulated environment requirements;
- Possession and maintenance of legal requirements for health and safety at work;
- Verification, including visual, of the adoption of Personal Protective Equipment (PPE) required for workers and respect the rules of industrial hygiene;
- Compliance with organisational and management principles that indicate the likelihood of ensuring effectiveness, efficiency, quality, and level of service;
- Economic-property capacity;
- Physical verification of incoming and outgoing ELTs stock;
- Keeping legal records.

Aiming at contributing to the creation of a climate of cooperation, in which each operator perceives Ecopneus not as a kind of "control authority" of their work, but rather as a reliable and authoritative partner, capable of generating benefits to their activities, the audits were not designed to be "punitive", but on the contrary, to be preventive and supportive to member companies in terms of environment and safety. Indeed, the audit devised by Ecopneus helps improving industrial, process and safety standards, providing a totally free support which traders can use to increase the quality of their activities, offering verification methodologies in the field of environment and safety, allowing operators to grow and, consequently, provide a higher quality service to Ecopneus and the national waste management system. With the aim at supporting our partners and promoting their integration of business sustainability, in 2011 Ecopneus also decided to join the **Sustainable Factoring Project** promoted by UniCredit Factoring in cooperation with TÜV Italia. The project aims at facilitating, also financially, the organisations belonging to the chain of client companies of UniCredit Factoring that supports it.
Ecopneus' partner companies that, following the verification con-

ducted by TÜV Italia qualified auditors, are deemed in line with the requirements of a specific Service Certification, focused on health and safety, environment and energy, stakeholders and communities, human rights, and the chain, can receive increasing credit terms from UniCredit Factoring depending on their level of compliance.

The community

The community

The creation of a sustainable satellite industry

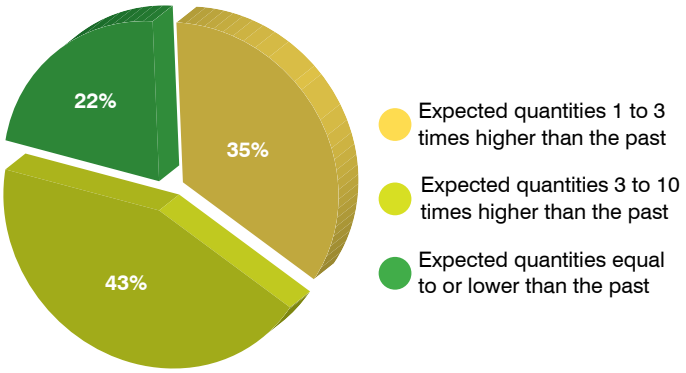
The application of Ecopneus' management model, requiring a thorough reorganisation of the ELT recovery chain, has impacted significantly on the satellite industry, both economically and in terms of upgrading the companies in the sector. In particular, joining a system in which they contribute to determine overall effectiveness, has greatly empowered operators in the chain while motivating them to interact proactively and to seek continuous optimisation of their performance. After just four months of activity, very significant impacts have been recorded.
On the **collection** side, for example, what was a strongly local concept is gradually turning into a system structured according to criteria of optimisation of logistics and increased efficiency. The need to ensure that the system meets the requirements, has necessitated the internal reorganisation of individual companies, driving them to greater planning activity to ensure continuity of work. These plans led to the creation of:

- Dedicated ELTs offices where collections across the country are analysed and planned;
- Local information and promotion to better target ELTs collection;
- Communication and specific meetings to better illustrate the system to the chain;
- Technical/economic analysis for the management of particular types of ELTs;
- Analysis of the "competition" and checking the correct application of national standards.

In terms of collection, Ecopneus' monitoring performed of the quantity of ELTs collected either manually or via container, as well as verifying the number of requests processed (and whether they correspond to those reaching the computer system), also allows the monitoring of logistical efficiency, providing ideas for programming possible improvements.
Among the most significant impacts generated by the first months of operation of "Ecopneus System", were a number of fundamental revolutions in shredding. These include an increased degree of specialisation by companies participating in the system, in terms of the

treatment of ELTs. Although it is true that many authorized systems are actually multi-waste management companies, which usually deal only with marginal amounts of tyres, an increasing number of the system's shredding operators are making the management of ELTs their main activity. We have already mentioned the obvious weakness of many treatment plants arising from the variability in the availability of input materials to the uncertainty of market outlets for outgoing materials.
In terms of the consolidation of the incoming flow, joining the system has produced a real revolution, providing certainty of supply at agreed prices. This has been made possible by the fight against the illegal ELTs disposal, which the extended producer responsibility system ensures through monitoring and reporting of all steps in the chain. The degree of change is obvious when comparing the average figure handled in the three years 2008-2009-2010 by individual companies with the expected flow downstream of the negotiation with Ecopneus.

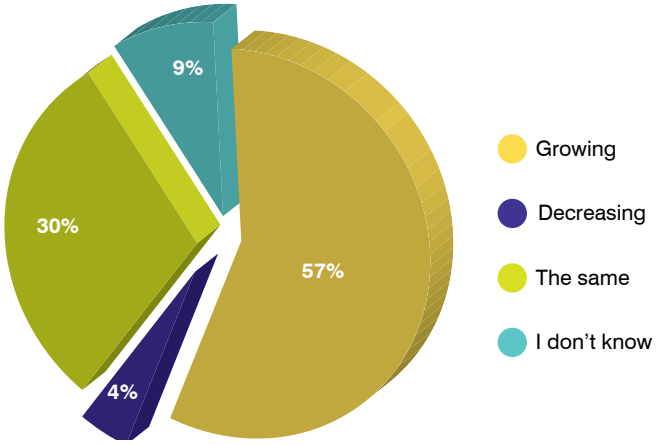
Historical comparison



This is equivalent to comparing the quantities that the plant could effectively handle prior to joining the system, with the quantities required by Ecopneus and compatible with the actual plant capacity and authorisations held by the companies. These data, available for 23 out of a total of 28 companies in the system, show that the average incoming quantity is almost three times higher than the average handled over the previous three years, and in some cases almost ten times more. The "revolution" brought by joining Ecopneus' system has necessitated a significant internal reorganisations at shredding companies to ensure that the now greater and more consistent flow of ELTs is fully dealt with (without prolonged storage) according to well defined process quality standards. Compliance with Ecopneus quality and safety standards has led many companies to:

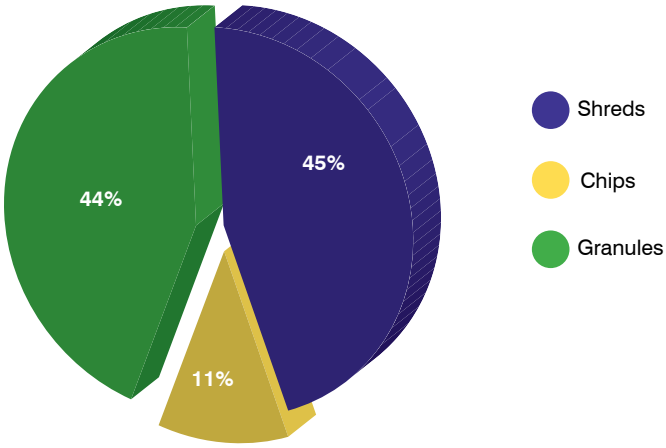
- Review the type of production;
- Programme maintenance and plant stoppages;
- Analyse their authorisations and request changes;
- Evaluate new technical investments;
- Recruit new staff.

Again, the introduction of Ecopneus' management system has led companies to adjust their "modus operandi" to meet Ecopneus' requirements, undoubtedly increasing the quality and quantity of data on which to perform ELTs analyses.



Investment in the shredding of ELTs is now

One fact emerging from Scuola Superiore Sant'Anna survey of shredding operators provides evidence of renewed excitement among shredding operators in the system. Operators were asked to assess investment by shredding companies in the current period. Over half of respondents judged that investment in the sector was growing and that it was due to the need to bring plants up to Ecopneus standards. Ecopneus aims to rebalance material recovery and energy recovery, given that Italy has historically shown a marked preference for energy over material recovery. Looking at ELTs derived materials production forecast for 2012, we see how following the criteria for selecting operators capable of increasing the flow of secondary raw materials should lead to an almost equal shredding output flow between energy recovery (shreds and chips) and material recovery (granules).



2012 Flow forecast

However, the production of granules and powders is a necessary but not in itself sufficient step to ensure the desired balance between material recovery and energy recovery. Indeed, the absence of strong markets for recovered materials is the main reason for the greater share held by energy recovery in Italy, and thus only by increasing the demand for recovered products will it be possible to produce the desired result. Ecopneus is paying great attention to the development of applications in the field of material recovery, in order to further focus their energies.

The main intended uses of ELTs derived materials

The main intended uses of ELTs derived materials

The main intended uses of materials arising from the recovery of End-of-Life tyres identified at the international level include:

Sports Surfaces (0.8 to 20 mm de-ironised granules) - The material obtained by the ELT granulation process is used as infill for artificial grass pitches and athletics tracks, shock-resistant flooring and equestrian surfaces. The drainage properties of the material, together with its elastic capacity to absorb shocks make ELT granules particularly suitable for such uses.

Insulating material (0 to 20 mm granules and de-ironised powder) - Rubber granules bound with polyurethane resins, are used to produce soundproofing panels, impact mats, waterproof membranes, anti-vibration and anti-seismic materials, particularly valued for their elastic properties of the material from which they are made and for accident prevention.

Street furniture, floors and manufactures (0 to 15 mm granules and de-ironised powder) - Rubber granules, bonded with polyurethane resins or in combination with other thermoplastic polymers, are used to produce street furniture (road bumps, traffic separators, curbs, etc.), mattresses for animal breeding, and rubber tiles etc..

Civil Engineering Works (whole ELTS or 10 to 400 mm shreds and chips) - Whole ELTs are sometimes used as a constructive element of soundproofing barriers, anti-erosion barriers, slopes stabilisation, coastal defences, drainage and heat-insulation for road embankments and drainage of new landfills. Shredded ELTs are used to replace inert mineral for the construction of rail/road foundations, light road embankments (bridges and tunnels), and stormwater retention basins. The drainage, imperishable, vibration, thermal insulation and low specific weight properties of ELT derived materials make it particularly suitable for such works.

Modified asphalts (0 to 0.8 mm powder and 0.8 to 2 mm granules) - Rubber powder is used worldwide in the production of modified asphalts. The mixture of rubber and asphalt is particularly appreciated for its durability, silence and braking grip. Indeed many international experiments have shown that it produces more durable and age resistant road surfaces (lower maintenance costs).

Reuse in mixes (0 to 0.4 mm powder) – Rubber powderis reused in new mixes for the production of technical articles, in proportions that vary according to the performance required from the end product and, to a minimal degree, in tyre mixes.

Mulching material (10 to 50 mm de-ironised chips) - Chips coated with polyurethane resin and coloured in various shades have found wide application in lieu of coniferous bark mulch for public and private gardens, central reservations, and roundabouts etc.. This application is not yet widely used in Italy.

Devulcanization (Regeneration) (0 to 20 mm, power and granules) – Rubber powder and granules, if subject to mechanical and thermal action or irradiated with ultrasound, undergo a process of devulcanization with varying results depending on the starting material and the technology used. The final product is particularly suitable for reuse even in high percentages in new rubber compounds. This operation therefore allows the complete reuse of polymers, which are again bound to new raw materials by a second vulcanization process.

The promotion of new uses of ELTs

One of the most problematic aspects of Italian ELT production is clearly the lack of development of markets that can absorb the quantities of secondary raw materials generated. Without a substantial increase in demand for these products, any increased production of granules and powders may be in vain. It is thus clear how we really need to promote better material recovery options from a technical and environmental point of view. During 2011 Ecopneus spent energy and resources on promoting new uses of ELTs, focusing in the first instance, on two fronts:

1. "Rubberized" asphalt;
2. Sports surfaces.

"Rubberized" asphalt

Rubber derived from tyres can be recovered in many ways, as well as being environmentally friendly, with excellent properties and performance from the technical point of view. One of the most important of these options is "rubberized" asphalt, something well established in many countries, but that is struggling to gain market share in Italy. One of the main advantages of the use of ELT powder for the production of modified bitumen, is the longer life of road surfaces, with consequently lower maintenance requirements. The integration of rubber in bituminous conglomeratese also increases the performance of the asphalt, thereby improving its elastic behaviour and thermal susceptibility, and reducing the incidence of permanent deformation and cracking. Environmentally speaking, the use of rubberized asphalt produces significant benefits over traditional asphalt in terms of reducing CO_2 emissions, land acidification, and energy consumption from fossil fuels. Alongside technical and environmental benefits, and as a direct result of them, we should mention the "social" benefits of lower social costs from accidents (caused by potholes, bumps and malformations in general in the road surface) and from roadworks. In order to facilitate the spread of this important ELTs recovery option, Ecopneus:

- Commissioned the Polytechnic of Turin in December 2010 **to monitor the experimental stretch of rubberized asphalt on the Borgaro to Venaria road**, with fees from Ecopneus along with the Province and the Polytechnic of Turin, in cooperation with FISE-UNIRE (the association of waste recovery and recycling businesses), SITEB (the association of road and bitumen operators) and ANFIA (National Association of the Automotive Industry). The contract provides for the bi-annual / annual monitoring of surface roughness, rutting, skid resistance, cracking and deformation;
- Commissioned the **Polytechnic of Turin to produce an information report**, which will provide the first scientific results on the use of "rubberized" asphalt, with data and measurements on the actual added value derived from the use of powder in

asphalt in terms of the economic, performance and environmental benefits related to Italy's specific characteristics;

- Co-funded the **Tyrec4life Project** (a project funded under the European Life+ programme). This is a three-year project conceived by CRF (Fiat Research Centre) and Ecopneus, which aims at developing and implementing innovative technologies to expand the use of powder from End-of-Life tyres in road paving. The Province of Turin, project leader, is working on this with a number of partners: the Polytechnic of Turin, ASM SpA (a regional development company, 90% owned by the Settimo Torinese town council), Fiat Research Centre, Ceipiemonte (Agency for Investments, Export and Tourism), Co.Ge.Fa. spa (road construction company), Brillada Vittorio & C SNC (road construction company);
- Various actions to **promote Green Public Procurement** (GPP) in road sector. These include the joint promotion with public bodies of GPP (which also includes rubberized asphalt) and cooperation with the company Ecosistemi, which coordinates the national GPP network. This led to **participation in the "Green Road" working group of MELS, which defines MECs (Minimum Environmental Criteria)** for the construction and maintenance of roads;
- **CompraVerde Forum of Cremona**, the main meeting place between supply and demand for green purchasing for Public Administration in Italy, organised a conference focused on the advantages of adding rubber powder to asphalt.

Sports surfaces

The sports sector is another area with huge potential.
The drainage properties of rubber granules and their elastic shock absorbent capacity make materials obtained by ELTs granulation process particularly suitable for artificial grass pitches, athletics tracks, shock-resistant flooring, and equestrian surfaces. In addition, the surfaces last longer, thus reducing maintenance costs.

Green Public Procurement

Green Public Procurement policy obliges public authorities to introduce "ecological criteria" in their procurement procedures to reduce energy consumption, CO_2 emissions, waste production and use of dangerous substances connected to the supply of goods, services and works. The European Union aims at introducing ecological criteria in at least 50% of contracts – totalling 102 billion euros in Italy (Ecosistemi 2011 estimate) - compelling all countries to adopt a National Plan of Action for the GPP, encouraging the spread of green purchasing. Italy approved the plan in April 2008 and is now approving Minimum Environmental Criteria for the various product categories - including construction and maintenance of roads and buildings - to be inserted in contract specifications, so that they can be classified as "green".

Given the widespread presence of sports facilities in Italy, together with the benefits mentioned above, we understand the importance of this sector for increasing the use of rubber recovered from ELTs. As part of the "**ELTs for sport**" project, Ecopneus has formed a **partnership with UISP** (Italian Union of Sport for All), which with its 17,500 clubs and 1,000 affiliated clubs allows Ecopneus to involve and spread its message to as many associations, federations, and leagues as possible. In cooperation with UISP, a questionnaire was distributed to 30,000 sports decision makers linked to the Union, in order to deepen our understanding of the sector. The survey also aimed at presenting Ecopneus, illustrating the reference "values" and the benefits arising from the use of ELTS recovered material, thus spreading the message about materials that provide excellent technical performance, while at the same time protecting the environment and health. Besides the two main fields of activity described above, Ecopneus carried out a series of important activities during 2011 to promote the use of recycled rubber products. In particular:

- The launch of a joint activity with CONSIP for the introduction of **recovered rubber products** in the **Public Administration Electronic Marketplace (MEPA)**. MEPA is a digital marketplace where registered PAs can search, compare and acquire goods and services offered by authorized suppliers who put their catalogues in the system;
- The production of a **report on ELT derived materials** aiming to effectively communicate the characteristics of these materials to chain companies, control authorities and Public Administration officials. The report will be published in 2012.

Standardisation is another important area where Ecopneus plays an active role at national and European level. In Italy, the company participates in the UNI GL14 Working Group, which sets technical standards for materials recovered from ELTs. At European level, in addition to participating in the work of CEN-TC 217 that deals with the standardisation of sports flooring and sports equipment, Ecopneus sponsors the Technical Secretariat of CEN-TC 366 Technical Committee on ELTs derived materials, which aims at creating technical standards that allow recovered materials to be properly defined by the recycling industry and the industry that may use them. It also coordinates a working group in the context of the Committee.

The spread of a culture of legality

Ecopneus' system can undoubtedly generate a major indirect impact on the community by promoting a widespread culture of legality in the management and use of waste. This is a field where too little has been done in the past and that, implying a profound cultural and methodological change, will take a long time to be fully implemented.

What does promoting legality mean?

- In terms of **Social Sustainability**:
  - Protecting health and safety of the public and protecting future generations;
  - Promoting a culture based on mutual respect and compliance with the law.
- In terms of **Economic Sustainability**:
  - Stimulating new market opportunities, defeating black economy;
  - Promote companies adhering to the rules and regulations by removing unfair competition on the market;
  - Monitoring flows in the sector in a clear and transparent way, thus making it more efficient;
- In terms of **Environmental Sustainability**:
  - Reducing the environmental hazards caused by poor waste management.

New regulations and Ecopneus' system aim at eliminating at least two levels of illegality, taking full control of the approximately 100 thousand tons of ELTs whose final destination is currently unknown:

- On the one hand **illegal dumping**, with 286 illegal sites identified in 2011 (1,335 from 2005 to 2011), for a total of over 882,000 square metres (6,993,087 total from 2005 to present);
- On the other hand **illegal trafficking**, so far affecting at least 16 Italian regions, involving a number of foreign countries as transit ports and the final destination for disposal, including: China, Hong Kong, Malaysia, Russia, India, Egypt, Nigeria and Senegal.

Ecopneus published the report "***Copertone Selvaggio* ("Wild tyre") - Numbers and accounts of trafficking and illegal disposal of used tyres in Italy**" in 2010 - second edition in 2011 – in association with **Legambiente**, one of the most active environmental

Patrizia Minocchi, Head of Marketing UISP

"The partnership between UISP and Ecopneus was formed in September 2011. We contacted Ecopneus in our search for new and reliable partners in the field of reuse and recycling, due to the renewed commitment of the association on this issue. The objectives of our partnership are to raise awareness among our membership base on the use of materials produced by End-of-Life tyres recovery in sports, in order to promote their adoption and use in the fields and facilities operated by UISP affiliated clubs, via a survey and preliminary implementation of a number of promotional events. As shown by the data, treatment and reuse of ELTs is an area with much potential for growth, thanks to greater sensitivity to the issue. We believe that Ecopneus will increasingly emerge as a major and recognised player on a par with other better-known consortiums. The impact of Ecopneus' activities on local and global communities and the environment can certainly be significant, above all at local level. Recovering and recycling ELTs also means removing them from illegal landfills that often disfigure the landscape.
This result may have great appeal for local communities of which the UISP, with its "sports for all" proposal, is an integral part."

organisations and a prominent figure in Italian civil society. This report explains the difficulties in terms of legality of the sector on which Ecopneus was preparing to launch.
As outlined in the report, the location of illegal sites unfortunately reflects the geographical breakdown of environmental crime, confirming the key role played by the so-called **eco-mafia** in the illegal management of ELTs.

	Campania	Puglia	Calabria	Sicilia	Total
Landfills seized	98	38	45	53	234
% of national total	34,3%	13,3%	15,7%	18,5%	81,8%
square metres seized	179.800	217.000	129.650	121.800	648.250
% square metres seized	21,9%	26,4%	15,8%	14,8%	78,8%

ELTs landfills in regions traditionally associated with organised crime in 2011

What possible damage is caused by the illegal treatment of ELTs?

Illegal dumping:
- Risk of fire, with possible consequent health emergencies;
- Proliferation of mosquitoes and mice (because of the hollow shape of tyres, which retains rainwater and creates a favourable habitat for these animals);
- Disfigurement of the landscape;
- Costs of cleaning up the affected areas.

Illegal trafficking:
- Release of resources to foreign countries, resulting in reduced business for companies involved in material recovery (Legambiente calculates an annual loss of somewhere between 25 and 35 million euros);
- Transport of other types of highly toxic waste disguised as ELTs;
- Transfer to unregulated countries, of waste that needs careful treatment and proper disposal (in terms of environmental impact and health and safety of the local populations);
- High earnings for organised crime (from which Legambiente calculates an annual loss for the state of around 140 to 170 million euros).

Edo Ronchi, Chairman of the Sustainable Development Foundation

Edo Ronchi, Chairman of the Sustainable Development Foundation "Organising an extensive and complex tyre collection system in itself represents a positive fee to the environment. If you were to succeed in giving greater economic value to recycling, ensuring a more profitable outlet, it would boost collection. Dumping would not save more money than disposal, but would actually cost you money, or at least, recycling would be more profitable. Ecopneus plays an important role due to the quantity of waste tyres it manages, but I particularly appreciate the determination with which this organisation and its leaders are committed to ensuring more possible outlets for tyres recovery.







A clear regulatory framework, which Ecopneus introduced in 2010, and the certainty of punishment, are two essential aspects for the promotion of widespread compliance with the law, also in waste management.

For the first time in 2001 Italy **introduced the crime of organised activities for irregular trafficking of waste** (ex Art. 53-bis of the Ronchi decree, now Art. 260, of Legislative Decree 152/2006), which is also currently the only environmental crime under Italian law. Jurisdiction over this type of offence was mainly assigned to the district Anti-Mafia prosecutors in view of its seriousness. Although the new legislation, as usual, will soon require the clarification of issues around application and interpretation, it represents a decisive step towards the optimisation of a legalised and efficient ELTs management system. Subsequently, the turning point towards a practical and operational approach to legality happened with Decree 82/11 and the introduction **of manufacturer and importer liability** for ELTs, with no charges for operators in the sector, such

Landfills in Italy 2005-2011

Region	Landfills seized	% of national total
Abruzzo	230	21,9%
Basilicata	159	15,2%
Calabria	141	13,4%
Campania	131	12,5%
Emilia Romagna	77	7,3%
Friuli Venezia Giulia	42	4%
Lazio	37	3,5%
Liguria	36	3,4%
Lombardia	33	3,1%
Marche	31	3%
Molise	30	2,9%
Piemonte	25	2,4%
Puglia	19	1,8%
Sardegna	16	1,5%
Sicilia	12	1,1%
Toscana	12	1,1%
Trentino Alto Adige	9	0,9%
Umbria	6	0,6%
Valle d'Aosta	3	0,3%
Veneto	0	0%
Totale	1.049	100%

as tyre dealers and resellers. The absence of an organised ELTs recovery system contributed to the proliferation of illegal practices and trafficking. In this change of system it is important to emphasise how, in the past, breaking the law was not just a choice in terms of cost-effectiveness, but also a necessity due to the lack of information about how to effectively treat ELTs. It is for this reason that from the outset Ecopneus has made a significant commitment to operators and ELT generation points to keep them informed about the new legislation and new modes and opportunities for recovery offered by it. It is indeed a crucial cultural and managerial shift for the operators themselves, who are "relieved" from the need to select reputable companies and are helped to operate in full compliance with the law.
Ultimately, legality means promoting a system of reciprocity and trust among operators in this very important sector, as well as in local communities that often in the past have had to suffer inconvenience and risk to their health and safety. Moreover, in terms of full sustainability, extending a waste management system built on solid legal bases enables the very practical protection and promotion of future generations, otherwise difficult to achieve.

Enrico Fontana, Head of the National Observatory for Environmental and Legal Issues of Legambiente

"Our relationship with Ecopneus created in 2010 is the result of a common understanding that establishing a chain of recovery and proper recycling of waste in our country is essential in order to effectively fight against illegality and environmental crime. Legambiente particularly appreciated that Ecopneus from the outset unexpectedly decided to make legality a priority issue to be addressed. Indeed, Ecopneus can play a significant role in establishing in practice, the principle that legality pays; promoting sustainable lifestyles among the general public; contributing to the growth of markets for recycled materials, also as a result of innovation and research; and fighting against international trafficking of ELTs. There is really a lot of work to do but the first results bode well."

Alberto Avetta, Councillor for Transport, Province of Turin

"I believe that post-consumer tyres management by Ecopneus will progressively eliminate their improper disposal. The total traceability of flows makes it possible to develop active recycling policies and to minimize offences, with obvious benefits."

CHALLENGES AHEAD

The creation of a sustainable satellite industry

This Report, which just covers four months of Ecopneus' activity in 2011, has provided a general overview of the first major new system of management of End-Of-Life tyres, with a measurement of impacts in terms of social, environmental and economic sustainability generated. At the end of the document, in tune with our commitments to transparency and accountability of our actions, we attempt to provide a coherent and detailed picture of the guidelines and objectives on which Ecopneus will be working in the near future. In particular, these objectives can be distinguished in terms of, on the one hand, the **creation of added and shared value** from an environmental, social and economical standpoint, and, on the other hand, in terms of the path of accountability undertaken. By the latter, we refer to the capacity of an organisation to report its activities in compliance with its commitments and the expectations of its stakeholders in terms of sustainability. It thus deals with Ecopneus' commitment to optimize its own sustainability management tools and at the same time to support the creation of added value in environmental, social and economic terms.

Future challenges

The creation of environmental, social and economic value

- **Developing applications downstream of collection:**
  - Promoting research and development;
  - Stimulating new and innovative market operators;
  - Building and strengthening partnerships in reference markets;
  - Building and strengthening partnerships with public bodies, particularly in the drive towards the use of Green Public Procurement

  .
- **Increaseof generated satellite industry** - Verification in the next Sustainability Report using performance indicators such as the number of jobs created by suppliers directly related to Ecopneus' system, including organisational improvements and innovations among chain operators (measured by an ad hoc survey), and the increase in revenues generated, in percentage, by ELTs collection operators.
- **Measuring** direct and indirect environmental impacts generated by Ecopneus' system.
- **Communication and accurate information** about ELTs to: operators, government agencies, and civil society

Accountability

- Strengthening the process of creating the final report;
- Checking the level of GRI indicators included in the report;
- Mapping of stakeholders - representation of the system of relations based on the principle of relevance.

Focus

"Giving value to waste"

General objective and overall aim of Ecopneus for the next three years is to concentrate on three specific objectives:

- Developing **applications in sports**;
- Encouraging the use of **recovered rubber in roads**, with further research about its consequences - a preliminary Life Cycle Management (LCA) activity and the evaluation of the exposure of workers who spread the bitumen and rubber, are already planned for 2012;
- Encouraging the production of **rubber furniture** for road infrastructure.

The commitment to monitoring and improving the environmental impact of the System

Over the last four months of 2011, the period covered by this report, Ecopneus and its operators have worked to reformulate the ELTs chain according to its own organisational model. This means, in accordance with the principles of efficiency, transparency and economy, and the minimisation of environmental impacts. The results of activities in late 2011 give a number of basic indications of the most critical aspects and what actions can be taken to further reduce the impact of the chain.

Logistics

There is no doubt that a significant part of the environmental impact of ELTs chain is related to logistics and in particular to road transport. Ecopneus' system provides for "container" or "manual" collection at different generation points. The average weight transported per trip varies as a function of the type of collection, but also due to other factors that do not make one mode necessarily more advantageous than the other. We will thus need to determine the conditions that render one mode preferable to the other in terms of overall and environmental efficiency of logistics. In other words, which mode ensures more weight carried per trip and thus minimises road transport. This also means organising collection and transport according to a detailed schedule of "multiple pick-ups" that thus optimise the collection trips. Ecopneus will also request information about the type of vehicle used to transport ELTs (to collection centres and from these to shredding centres) in order to be able to define the average fuel consumption per km and thus directly measure the impact in terms of CO_2 production. Currently carriers are just required to give the vehicle's number plate but not the type.

Shredding

In the next step, that of shredding, the definition of environmental impact cannot be separated from the measurement of energy consumption of the plants. Literature data give the average power consumption of mechanical and cryogenic shredding. However, these values can vary substantially depending on the type of system and how it is used. Some data on energy costs incurred by shredding operators in Ecopneus' system suggest that there is scope for substantial improvement. This is why Ecopneus intends to map the collection of information on the energy consumption of these plants c/o their operators, creating an improvement programme for them starting from an energy audit campaign.

Recovery

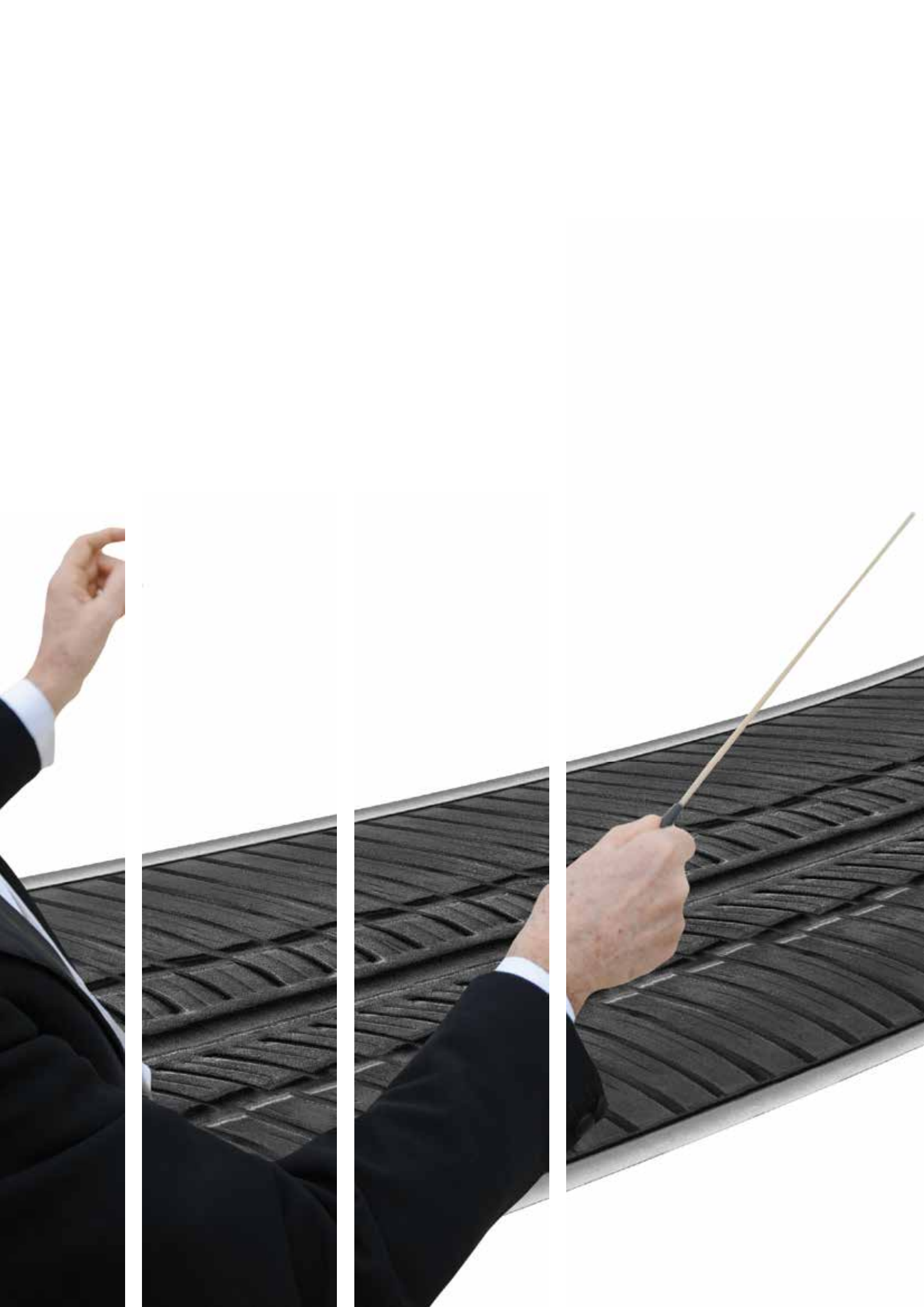
Ecopneus is committed to creating a system in which material recovery from shredding plants is just as popular as energy recovery. This model, by differentiating material or energy recovery options, also offers greater guarantees of finding a suitable location for ELTs shreds/granules under economic conditions different to the current ones. It also most closely complies with Community rules for waste management that give material recovery a higher priority than energy recovery, as it generally offers greater environmental benefits. Ecopneus' commitment in this area has meant that shredding operators possess the necessary capacity to produce granules and powders. Further work will be lavished in the promotion of market opportunities for the absorption of these products, currently suffering in an uncertain market.

Focus

Commitment to Research & Development

We will fund a particularly broad spectrum of research and development activities in 2012. These again include different activities related to the promotion of ELTs use, such as:

- The continuation of activities relating to the Green Road working group for the definition of MECs (Minimum Environmental Criteria) in roads building and maintenance;
- Partnership in the Life+ "Tyrec4life" project, aimed at removing barriers that limit the use of rubberized asphalt in Italy;
- Cooperation with the Polytechnic of Turin in monitoring the spreading of rubberized asphalt, in order to strengthen and further document knowledge of the technical performance they offer.



List of ancronyms

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ACI - Automobile Club of Italy
MEC - Minimum Environmental Criteria
CC - Collection Centres
SC - Shredding Centres
CO_2 - Carbon Dioxide
CSR - Corporate Social Responsibility
PPE - Personal Protective Equipment
GPP - Green Public Procurement
GRI - Global Reporting Initiative
LCA - Life Cycle Assessment
MELS - Ministry for the Environment, Land and Sea
SRM - Secondary Raw Materials
NOx - Nitrogen oxide
ELT - End-of-Life tyres
UT - Used Tyres
CSR - Corporate Social Responsibility
SCPA - Joint-Stock Consortium Company
SO_2 - Sulphur Dioxide
UISP - Italian Union of Sport for All

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