
ACTIVITY

REPORT





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TECHNIGOM





MARK THYS
PRESIDENT OF THE BOARD OF DIRECTORS



HERVÉ DOMAS
MANAGING DIRECTOR

OUR DEMANDING NATURE HAS BECOME OUR TRADEMARK

With more than 350,000 tonnes of end-of-life tyres, or the equivalent of 46 million passenger vehicle tyres, Aliapur set a new collection record for 2017. Our sector, which is based on the Producers Responsibility, easily attains its collection targets every year, and with flawless traceability. To achieve this, Aliapur has highly motivated teams, who defend our demanding vision of operational excellence, and high performance service providers, who have brought about positive change in their companies, professions and work tools.

“ Aliapur has highly motivated teams, who defend our demanding vision of operational excellence, and high performance service providers, who have brought about positive change in their companies, professions and work tools.”

These operational demands have taken us beyond the strict framework of Aliapur's activity as, in the last ten years, we have also made it available to the association Recyvalor. This association was created in 2008 by 28 companies and organisations from the car and tyre sectors as a means of decreasing the number of tyres dumped illegally and which disfigure the countryside. Recyvalor is supported by the State and officially completed its mission in November 2017: 55 sites cleaned, 7 million tyres recovered and processed. With this, Aliapur was far-removed from its initial mission, which is defined by decree and has been included in the French Environmental Code. But we chose to remain a part of this programme as we consider it to be an ethical and even moral obligation to bring an end to this illegal dumping.

Our demanding nature has thus become our trademark: collection targets achieved 100%, a second life given to every tyre, reliable and innovative recycling solutions, and investment that goes beyond the strict framework at the heart of our mission. And all this is achieved intelligently, in cooperation with the State, which supports us.

Only the future will tell us if this type of organisation needs to be further supervised by the State, but our position is clear: we have no desire to risk disturbing a tool that has operated permanently in an optimal manner.

INDEPENDENCE AND PLURALITY IN RECOVERY

In 2017, for the first time, the volumes of tyres processed by Aliapur were higher than the tonnages collected from car industry professionals in the course of the year. We recycled 376,000 tonnes in total (the equivalent of almost 50 million passenger vehicle tyres), or 26,000 tonnes (3.5 million tyres) more than the number collected. This excess represents the stock that we were unable to process in 2016, following the decision by the Moroccan authorities to no longer accept imports of waste into the country.

This incident occurred very suddenly and was very worrying. It could also have led to problems. In the end, though, it was stimulating and allowed us to implement a diversification policy for recycling solutions for end-of-life tyres, and we consolidated this policy in 2017.

In this, Aliapur's strategy has changed considerably: being dependent on one dominant recovery method or recycler more than another is neither desirable nor reassuring. In the last two years, we have been working actively on a more subtle and more balanced distribution of our end-of-life tyres between material recycling and energy recovery, between the different industries, and naturally between destinations – in France, in Europe, and beyond.

At the same time, we remain very attentive to the French solutions that could be implemented and could absorb volumes, such as urban heating plants. Since 2008, we have delivered made-to-measure tyre shred to the Swedish urban heating plant in Norrköping, which supplies 100,000 homes – and the Swedes are not known to be laxist when it comes to protecting the environment. We are convinced that this solution could be adopted in France, and it would be perfectly in line with the government's energy transition policy. It would also save communities from having to buy expensive fossil fuels from the other side of the world.

In fact, it would be enough if just 2% of the coal imported into France were replaced with shreds in the energy sector for tyre recycling to be carried out wholly in France. Just 2%.

“ Aliapur's strategy has changed considerably: being dependent on one dominant recovery method or recycler more than another is neither desirable nor reassuring.”



GAINING WEIGHT...

Aliapur and the Ademe organised an "average weight campaign" in 2017. These campaigns make it possible to adjust the average weight of tyres over the years. This is particularly necessary for car tyres, which change as often as cars do: if cars get bigger (SUV, minivans, sedans, etc.), the tyres quite logically do too. The average weight of a car tyre thus officially increased from 7.57 to 7.89 kg on 01 January 2018. For one tonne, there are now 126 tyres instead of 132.

...BUT AT A LOWER TARIFF

Since 2004, the eco-tax for car tyres has followed a curve that is inversely proportional to the weight of the tyres: the weight increases over the years, but the eco-tax keeps dropping. This was the case once again on 01 January 2018, with the tax for car tyres dropping from €1.25 to €1.18. From the €2.20 when the sector first started out in 2004, there has thus been a drop of 46% in the cost of processing a car tyre.

SHARED EXPERTISE

In the context of a future partnership with organisations in the overseas territories, an Aliapur delegation went to Guadeloupe in the spring to meet with all the institutional partners and key players involved on site in the processing and recycling of tyres. Through this accompaniment approach, Aliapur hopes to bring its technical and operational expertise to the key players overseas.



THE CURIOSITY OF A SENATOR

On 12 April, Aliapur received a visit from Didier Mandelli, Senator for Vendée. Didier Mandelli is a member of the French Commission for Sustainable Development and Land Planning. He is also the co-President of the study group on waste management. It was for the latter that he travelled to Lyon, keen to better understand the Aliapur sector, how it functions, what it leads to and its projects.



THE SQUARE WITH 1,000 TYRES

In June, in the middle of Paris, a participatory project brought back to life a square that had been left abandoned for several years. This required building, at low cost and preferably with recycled materials, a new play area for children. Aliapur was asked to participate and gladly offered a thousand new tyres to create this fun, original area. The tyres were piled up, cut, pierced, tied up, tied together or hung up – giving them an unusual and long-lasting second life.

BILINGUAL MULTIMEDIA

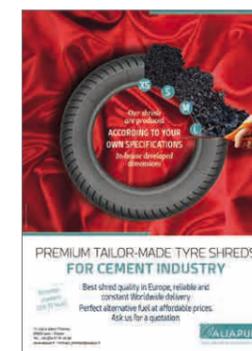
Since autumn 2017, Aliapur has published a multimedia newsletter. This new means of communication makes it possible to promote the activity of the sector, provide more detail on how it functions and its news, and promote both companies and projects. "La News!" is its name, and it can be accessed via a direct link on the homepage of the Aliapur website, although it has its own graphic identity. It uses videos, interviews, reports, photos and animation. Three editions have been published between October 2017 and January 2018, including one specially devoted to the granulate found in synthetic turf, and one to our hackathon, OpenWaste. Each newsletter is also published in English, including the videos and animated films.

5TH EDITION



This is the 5th year in a row that Aliapur has issued environmental savings certificates to the professionals that have had tyres collected at least once in the year. Sent out in January on

the basis of the figures from the previous year, these certificates convert the number of tyres collected into savings in water, kWh and fuel. First implemented for collections from 2013, the recipients now wait for them with anticipation – or even ask for them in December!



MY TAYLOR-MADE TYRE

In the autumn, Aliapur launched a targeted media campaign in the specialist international press to promote its end-of-life tyre shred used as a premium alternative fuel source in cement works. This campaign goes hand-in-hand with the strategy declared in the last two years by the company to diversify its recycling solutions, for a more balanced distribution between industrialists and destinations. The multiplication of new contracts has shown the validity of this ambition.



CARTOONS

Practical, fast-moving and pedagogical: Aliapur had two animated films (or motion design videos) made in 2017. "The second life of tyres", a general, institutional film, explains the wide range of solutions for recycling tyres implemented by the sector. "The second life of tyres in cement works" was an extension of the first film, with a particular focus on tyre shred used as a fuel source in cement works, and the quality control implemented. Other animated films are being prepared.



OUR YEAR IN FIGURES

2017

350,000 TONNES IN THE BALANCE

Financial elements for Aliapur in 2017:

- With an increase of +0.7% in relation to 2016, Aliapur achieved turnover of **€55M**. The vast majority of this income comes from orders from producers for €51.4M, or a little over 350,000 tonnes
- 2017 ended with net income of **+€329K**
- **90%** of expenditure in 2017 was attributed to order processing (collection, shredding, transport and recycling)

THE SHAREHOLDERS AND THEIR REPRESENTATIVES ON THE BOARD OF DIRECTORS

Shareholders	Permanent representative on the board of Directors
Bridgestone France	Mr Benoît RAULIN Mrs Brigitte GBAGBA
Continental Holding France	Mrs Pascale WOITTEQUAND Mr Serge BONNEL
Goodyear Dunlop Tyres	Mr Grégory BOURCHARLAT Mr Mark THYS President of the Board of Directors
Manufacture Française des Pneumatiques Michelin	Mr Pierre-Yves COMBY Mr Thierry MARTIN-LASSAGNE
Pneus Pirelli SAS	Mr Grégory BARSİ Mr Matthieu BRINON

BALANCE SHEET (IN K€)

<u>Real estate</u>	<u>Income collected in advance</u>
479	3 015
<u>Other debts</u>	<u>Debts</u>
2 268	16 831
<u>Accounts receivable</u>	<u>Equity</u>
9 558	7 926
<u>Treasury</u>	<u>Provisions</u>
17 081	1 614
ACTIVE	PASSIVE
29 386	29 386

DISTRIBUTION OF COSTS IN 2017 FOR €1.25*



*€1.25 : eco-tax for a passenger car tyre in 2017

FINANCIAL RESULTS (IN K€)

	2017	2016
Turnover	55 025	54 636
Subcontracting	48 516	47 758
Gross operating surplus	6 509	6 878
Net income	329	304

Non-operational expenses

Non-operational expenses remained stable, at around €6M

- R&D was nevertheless higher in 2017, with €778M (or 1.4% of turnover) devoted to the search for new recovery methods. This was €159K more than in 2016 (+26%)
- On the contrary, the IT department continued its internalisation with savings of **€202K**, while continuing the developments necessary for Aliabase (the sector's professional tool).
- **€403K** was used in communication, or 0.7% of turnover

KEY DATA

350,008 TONNES: RECORD COLLECTIONS FOR THE 5TH YEAR IN A ROW

The symbolic figure of 350,000 tonnes was passed in 2017, representing the highest number of tyres collected since the sector's beginnings in 2004. And once again, Aliapur has fully succeeded in its mission with a target attained at 100.57%, or a controlled excess of 2,000 tonnes in relation to the orders placed by its clients. This confirms the maturity of the sector, in which the collection service providers know their missions and their geographical sectors perfectly, while also being capable of adapting in real time to fluctuations in their activity.



360,000 TONNES

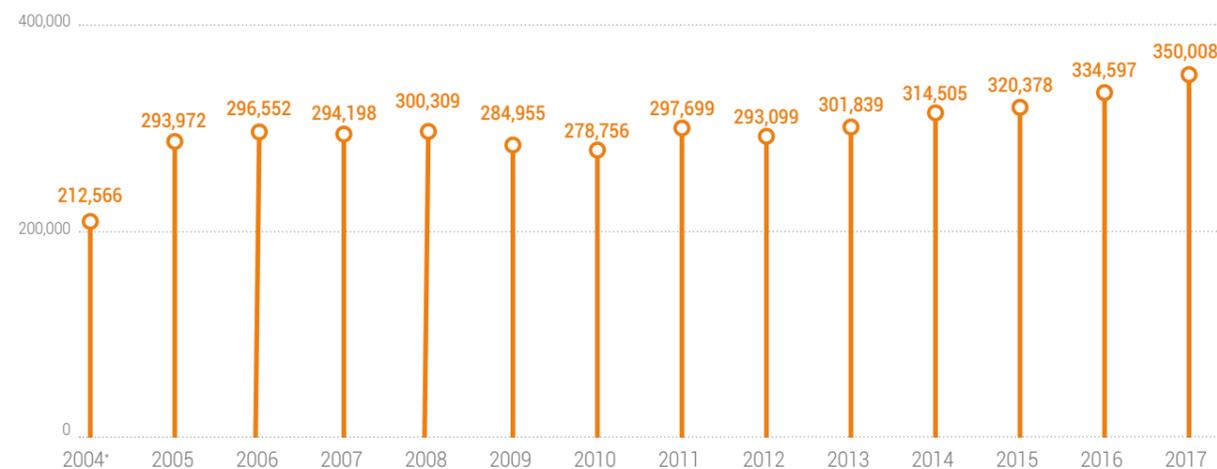
This is the estimation of the volume that the Aliapur network will aim to collect in 2018, taking notably into account growth in the sales of new tyres



MORE THAN
4 MILLION TONNES

have been collected by Aliapur since 2004, representing more than 500 million passenger vehicle tyres

EVOLUTION IN COLLECTIONS IN TONNES



*The operational collection activity for end-of-life tyres in the Aliapur sector started on 01 March 2004. That year, Aliapur thus made collections in just 10 months.

KEY DATA



1 COLLECTION
PER MINUTE

This represents 144,467 collection operations in the course of the year

2/3 MANUAL
COLLECTIONS



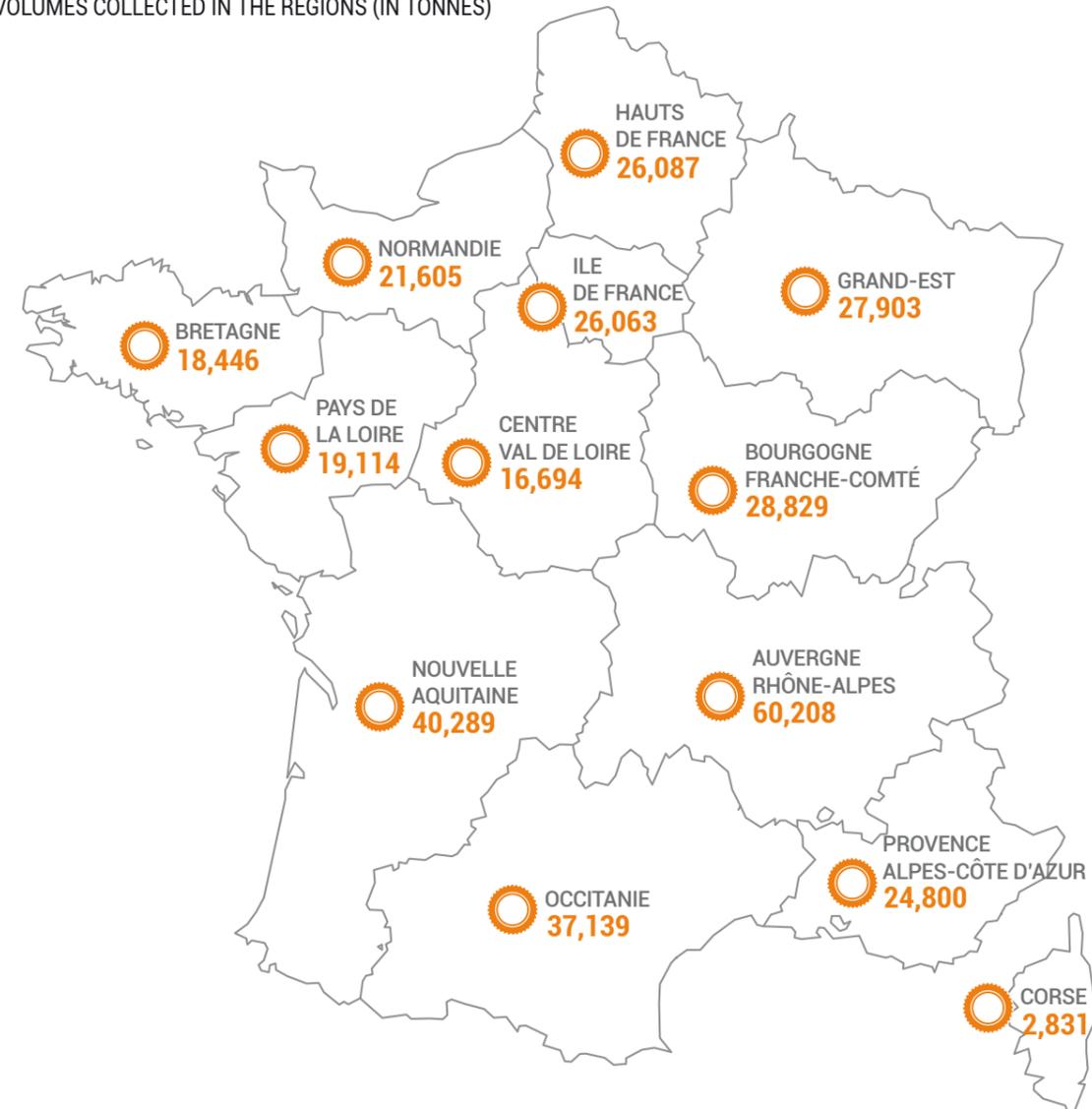
1/3 SKIP
COLLECTIONS



46 MILLION
PASSENGER
VEHICLE TYRES

This represents 350,008 tonnes collected in 2017

VOLUMES COLLECTED IN THE REGIONS (IN TONNES)



CLIENTS: DIFFERENT PROFILES, ADAPTED CONTRACTS

 **345** CLIENTS



14 MANUFACTURERS



17 INTERNET SITES



41 CONSTRUCTORS



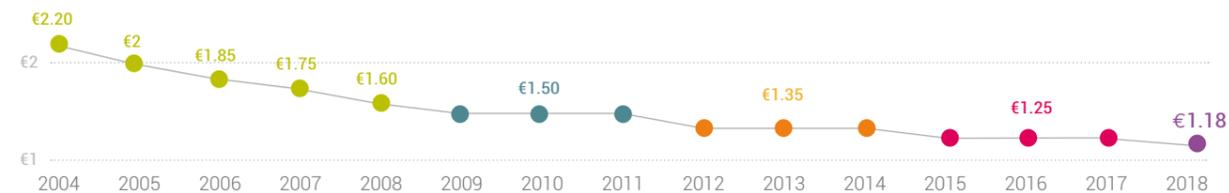
273 OTHER CAR INDUSTRY PROFESSIONALS

The vast majority of Aliapur's clients have a multi-annual contract for the declaration of their tyres. But certain car industry professionals (repairers, distributors, etc.) sometimes take advantage of opportunities to buy foreign tyres at preferential rates: these are generally limited quantities of tyres and supplies are irregular. To respect their regulatory obligations, these professionals must nevertheless declare these tyres, describing themselves as "occasional tyre producers".

Since 2013, Aliapur has thus set up a simplified, factual procedure which does not impose a duration. This occasional declaration covers a maximum volume of 600 passenger vehicle tyres (cars, 4x4, utility vehicles, two-wheeled vehicles, or any tyre weighing less than 15kg) and a maximum volume of 100 truck tyres, agricultural, civil engineering, public works, or maintenance vehicles, or airplanes.

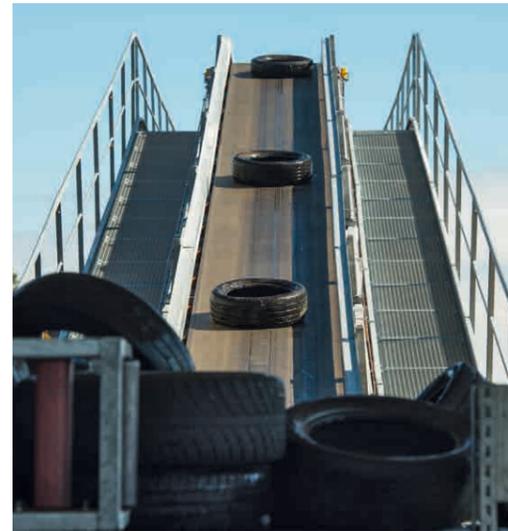
The eco-tax tariffs for these "occasional producers" are exactly the same as for clients under contract. From 2018, they will be able to pay this eco-tax directly on line. In addition, Aliapur is considering generalising this type of payment.

ECO-TAX EXC. VAT FOR CATEGORY A TYRES (PASSENGER VEHICLE TYRES)



CONTRIBUTIONS PER TYPE OF TYRE

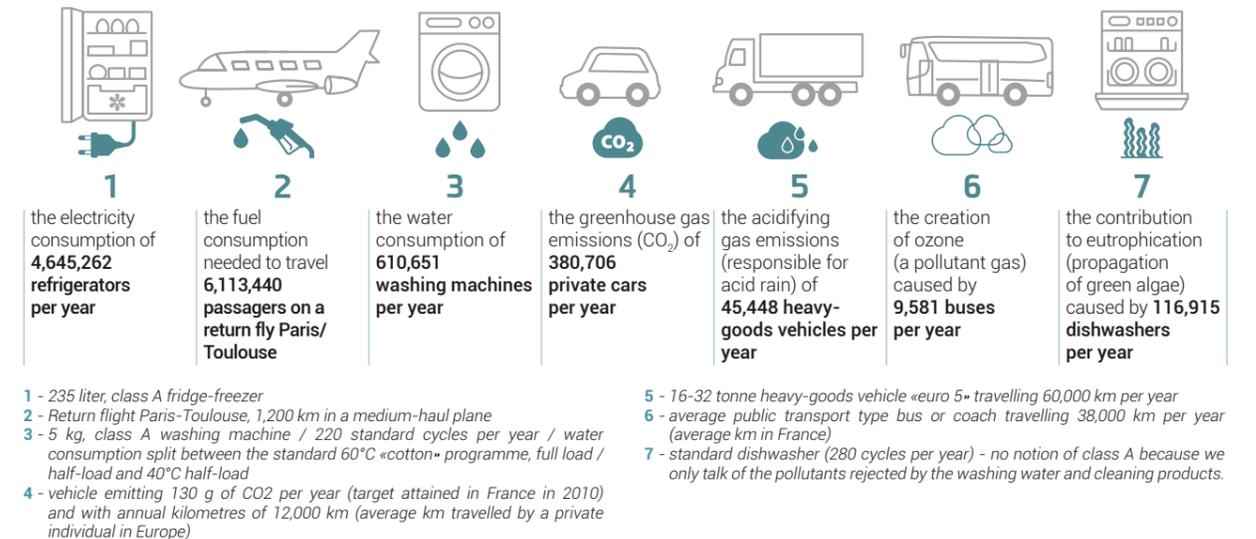
ALIAPUR CATEGORY	AVERAGE WEIGHT	TYPE OF TYRE	PRICE EXC. VAT 2017	EVOLUTION EXC. VAT 2004/2018
A1 (3 to 5 kg)	4,06 kg	Motorbikes, quads, all tyres between 3 and 5 kg	€0.75	-25,00%
A2 (5 to 20 kg)	7,89 kg	Cars, 4WD, small utility vehicles, all tyres between 5 and 20 kg	€1.18	-46,37%
A3 (5 to 20 kg)	7,89 kg	Special tyres (pluggable, equipped with extra features...), on the condition that they be easy to identify during sorting	Price defined in relation to tyre specificities	
B1 (20 to 80 kg)	53,99 kg	Utility vehicles, truck, all tyres between 20 and 80 kg	€8.60	-20,38%
B2 (20 to 80 kg)	53,99 kg	Special tyres (pluggable, equipped with extra features...), on the condition that they be easy to identify during sorting	Price defined in relation to tyre specificities	
C1 (80 to 130 kg)	92,12 kg	Agricultural, civil engineering, public works, maintenance vehicles	€19.50	-27,75%
C2 (130 to 200 kg)	161 kg	Agricultural, civil engineering, public works, maintenance vehicles	€32.30	-42,68%
D1 (200 to 450 kg)	257,17 kg	Agricultural, civil engineering, public works, maintenance vehicles	€54.15€	-63,90%
D2 (more than 450 kg)	465 kg	Agricultural, civil engineering, public works, maintenance vehicles	€101.65	-37,54%
E (less than 3 kg)	2 kg	Scooters, all tyres less than 3 kg	€0.48	-42,17%
F1	Average 77 kg	Commercial aircraft	€17.10	-36,55%
F2	Average 6 kg	General aircraft	€1.45	-30,95%
F3	Average 16 kg	Military and regional aircraft	€3.15	-43,75%



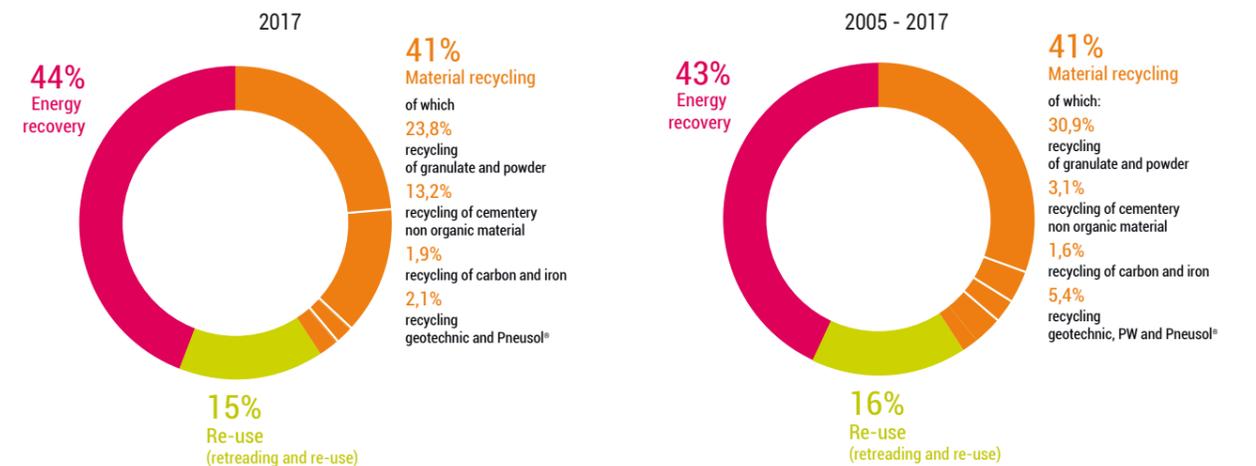
ENVIRONMENTAL ADDED VALUE 2016

Excluding re-use (re-use and retreading), 342,346 tonnes of end-of-life tyres were recovered by Aliapur in 2017, or the equivalent of 45 million passenger car tyres. The recovery of these tyres has made it possible to make savings in natural resources and environmental impact. The LCA of end-of-life tyres makes it possible to express these savings as equivalents of uses of equipment and actions from day-to-day life.

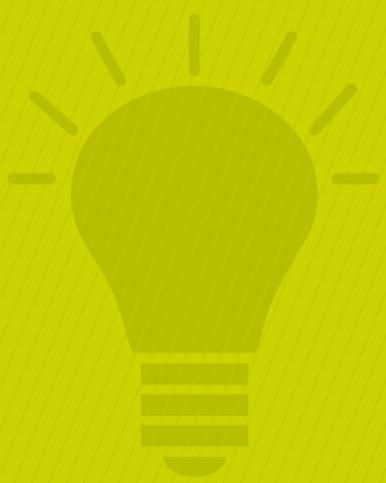
45 MILLION OF END-OF-LIFE TYRES (EXCLUDING RE-USE) ALLOW THE ECONOMY OF:



RECOVERY DISTRIBUTION



OUR YEAR OF OPERATIONS



INVENTORIES VIA DRONE, A NEW INTERNAL SKILL

5 minutes

...Like the actual flight time of the drone. It is not much, but in reality it is quite enough to record all the information in the form of a cloud of dots which, once decoded by the software and compared, provide extremely precise cubic volume calculations of the stocks to be inventoried.



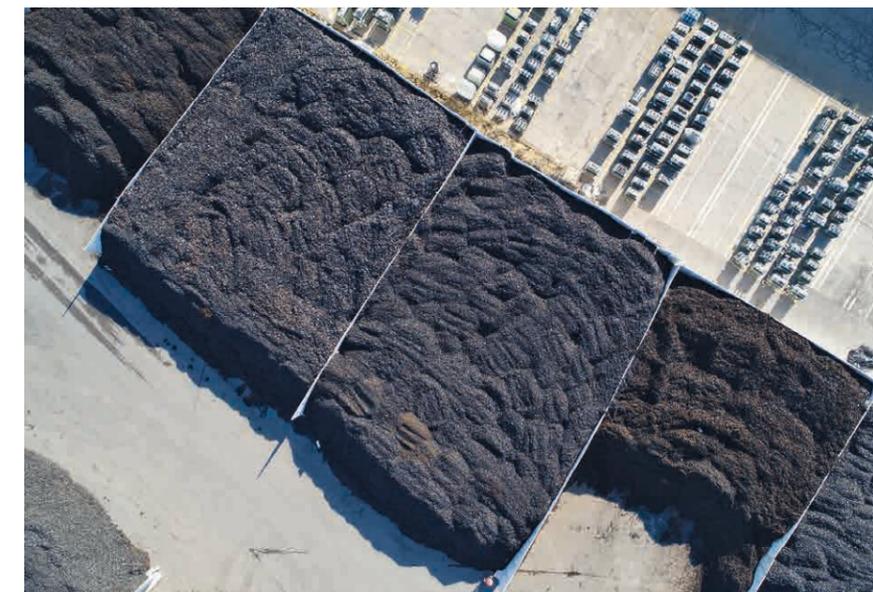
Every year, at the end of the fiscal year, Aliapur inventories the stocks of whole tyres and shred that remain on the transformation sites so as to tally the volumes physically present on the premises of the service providers with the figures recorded in the computerised databases. Until 2014, these inventories were made by weighing all the remaining stocks, requiring the presence of a driver and a truck for one to two days, depending on the quantities. This also resulted in the corresponding CO2 emissions, and partially disrupted the running of the site. In 2015, Aliapur turned to the certification organisation, SGS, and tested inventory-taking with lasers, thanks to an operator installed in a cradle suspended over the stocks to be inventoried. The time needed for the operation dropped to half a day and, above all, it was no longer necessary to move the tyres or shred. In 2016, the cradle was replaced with a drone equipped with an onboard camera, controlled by an operator receiving video feedback on an electronic tablet used as a control panel.

Inventoring the cubic volume has never been as quick or as reliable, as the maximum rate of error remains less than 1%. Logically, Aliapur wanted to internalise this know-how. Piloting a professional drone, however, is nothing like using one for pleasure: it requires much more precise skills and, above all, an aptitude certificate issued by the DGAC (French general direction for civil aviation) – the same certificate as for microlight pilots. For now, the Direction for Operations can carry out the stock inventories without an external operator and the organisation SGS simply validates the cubic volumes and density on the basis of the data analysed.

HOW DOES IT WORK?

In flight, the drone is permanently geolocated. Above all, it is equipped with software that makes it possible to measure its altitude with great precision. It can thus detect the variations in height that it finds as it flies over a site, a building or a pile of shred. It is also capable of defining the geographical coordinates.

Compiling these cross-referenced data makes it possible to determine the volume flown over, as well as the density – and thus the tonnage – of the stock analysed. In addition, the aerial imaging techniques provide photos of outstanding quality.



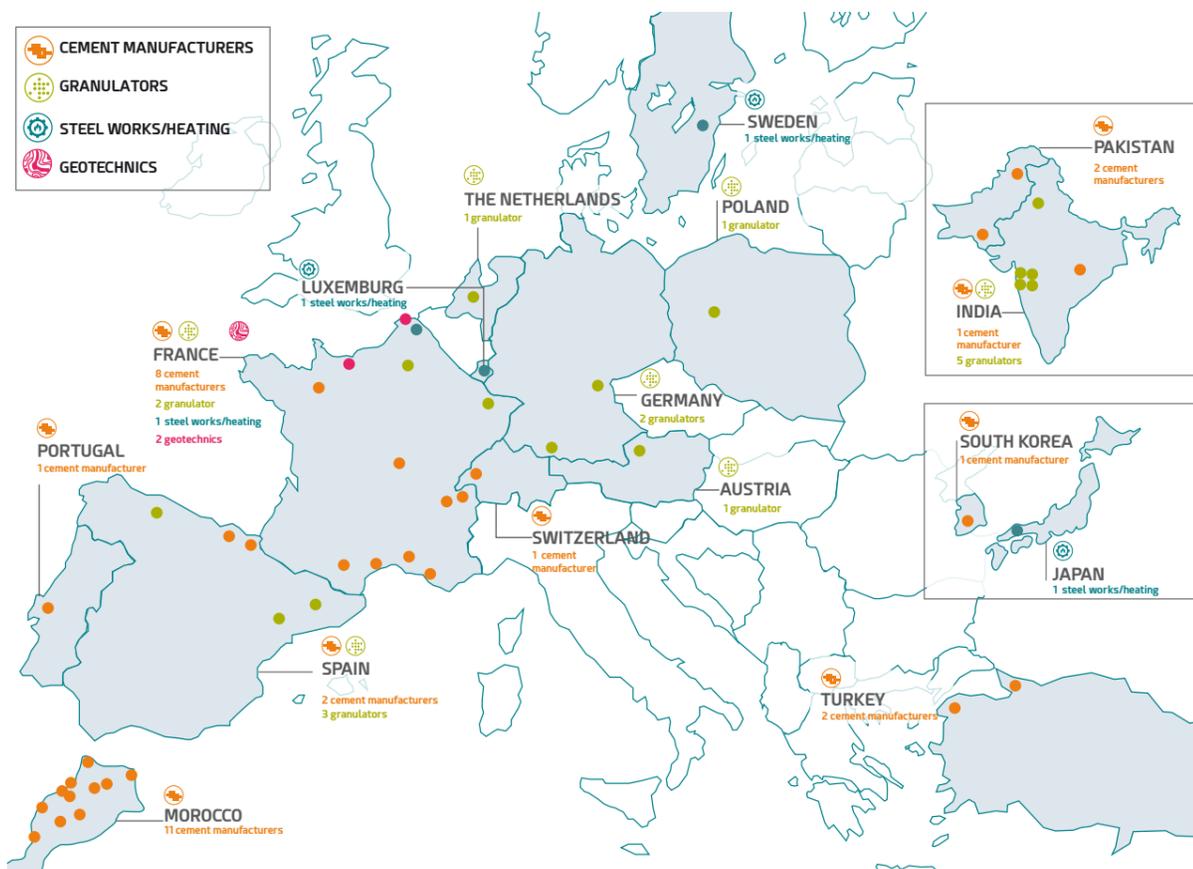
THE DIVERSIFICATION CONTINUES

68%

of the volumes were recycled in Europe, across all industries.

More than 376,000 tonnes of tyres were recycled in 2017: the 350,000 tonnes obtained from annual collections in the strictest sense of the term, to which were added 26,000 tonnes that were not recycled in 2016 because of the inopportune and brutal stoppage, for 6 months, of imports of waste by Moroccan cement manufacturers. This absolute record of 376,000 tonnes shows the success of the strategy adopted by Aliapur in the last few years to diversify its recycling solutions. It is also recognition of the quality of the products prepared by the French sector, products which are now sought by industrialists from as far away as Japan, Korea, India and Pakistan, with a regular increase in demand.

THE RECYCLERS UNDER CONTRACT WITH ALIAPUR



An exceptional month of December

December 2017 broke all records. No less than 7 vessels were sent to Portugal, Morocco and Turkey. Between sea and road transport, Aliapur sent almost 52,000 tonnes to the recyclers in the sector, or almost twice as much as a normal month. 55% of these volumes were delivered outside of Europe.

EXPORT: CONTAINERS IN ADDITION TO BULK

700 containers

measuring 40 ft (76 m³) were needed to transport the 18,500 tonnes of shred sent to recyclers in India and Asia.

The diversification in recycling methods (see facing page) has brought about changes in terms of logistics. Until 2015, the tyre shred sent abroad was, for the most part, sent to the cement manufacturers in Morocco: the product was loaded in bulk on to sea-river barges or vessels, as bulk was the most reasonable solution for a destination not very far away and involving coastal navigation in generally clement conditions.

But bulk is poorly adapted to long distances, unless a whole vessel is chartered at exorbitant cost. With new clients located on the other side of the world, it was thus necessary to find another solution. In 2017, Aliapur tested loads of shred and tyre pellets in containers, making it possible to transport them door-to-door, eliminating the need for loading and unloading. We were thus able to avoid all storage and product handling operations in the departure and destination ports. The shred was loaded into containers directly at the transformation sites in the sector, and was unloaded on the premises of the end client. For destinations such as India and Asia, container transport also represents a financial advantage as the vessels make their return trip with a lighter load than for the outbound journey. The sector thus benefits from a competitive tariff for the transportation of its products. Nevertheless, the transformation sites had to face up to new constraints, particularly loading shred through the back of the containers, when the skips used usually are loaded from the top. New charging funnels were installed, and 6 sites have already been equipped with specific conveyor belts.

MARINE

367 vessels loaded with shred have been sent abroad by Aliapur since 2004, across all destinations, including 31 in 2017.

ROAD

425 lines (journeys) were opened by Aliapur in 2017 for the road transport of shred and whole tyres. These journeys were carried out by 40 transporters.



MISSION ACCOMPLISHED FOR RECYVALOR



Never again!

On 20 February 2008, the non-profit association Recyvalor was created by the main actors in the tyre industry: distributors, manufacturers, car manufacturers and professionals from the tyre, waste and environmental sectors. With the support of the French state through the Ademe and environmental protection association Robin des Bois, 28 companies and organisations voluntarily mobilised to combat the health, safety and environmental risks associated with open air tyre dumps. On 23 November 2017, having attained its objectives, Recyvalor organised a closing ceremony at the French State Department for Ecology, in the presence of the Secretary of State, Brune Poirson, who congratulated the members of the association for the success of this initiative that is unique in Europe in terms of environmental protection. "Recyvalor's strength is that it brought together very different players from the tyre industry, and succeeded in mobilising them in exchange for membership and the significant participation of each one to finance the depollution of the tyre dumps that no one wanted to take responsibility for," says Bénédicte Barbry, the President of Recyvalor.

10
years of action

7 MILLION
TYRES COLLECTED
55,000
TONNES RECYCLED

61 HISTORIC STOCKPILES IDENTIFIED

54 SITES CLEARED



Never again!



Brune Poirson, the French Secretary for ecology and solidarity transition



Mark Thys, President of Aliapur's Board of Directors

€8.3
million committed

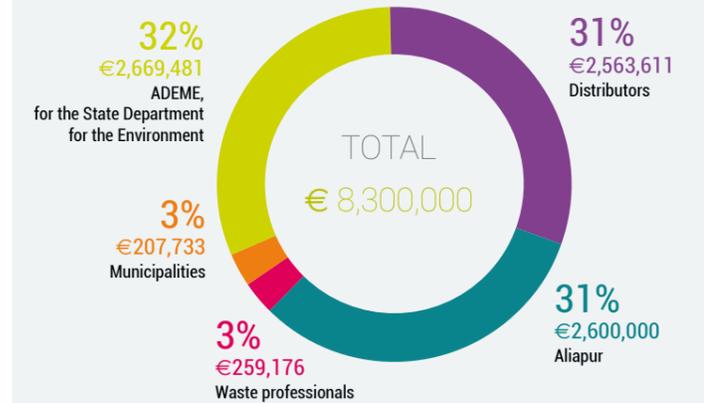
28

key players from the tyre sector mobilised, with the support of the State and an NGO

ALIAPUR, THE OPERATIONAL EXPERT

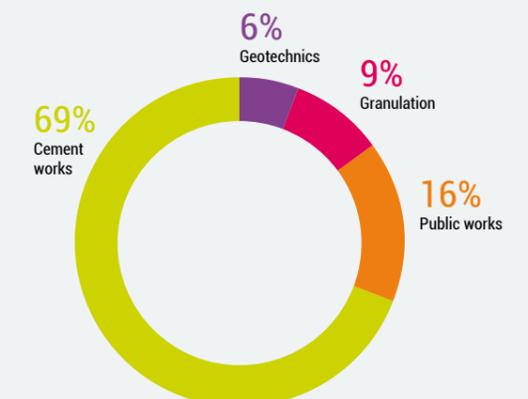
Since its creation in 2008, Recyvalor has been operational in the field. In addition to funding the association up to a third of its budget every year, the manufacturers also provided Aliapur's know-how. The team committed itself voluntarily to this action, both at headquarters and in the field: the company managed the finances for Recyvalor with strict cost control, provided its knowledge of the management and processing of end-of-life tyres, and took on responsibility for all the administrative tasks (some of which were complex) for processing the stocks, whether they were situated on public or private land. Above all, Aliapur allowed the association to take advantage of both its knowledge of recycling solutions for the tyres collected, and a network of recyclers, making it possible to recycle each of the 7 million tyres collected in almost 10 years.

VOLUNTARY FINANCIAL COMMITMENT



The association's entire budget was allocated to interventions on sites. The members of Recyvalor were also responsible for the association's operating costs: the members worked voluntarily, paying their own travel expenses, the headquarters was housed at the CNPA, and the meetings were organised in the offices of the Secretary of State responsible for the Environment.

DISTRIBUTION OF THE RECYCLING FOR THE TYRES COLLECTED BY RECYVALOR IN 10 YEARS



OUR YEAR IN R&D

A WIKI FOR KNOWLEDGE AVAILABLE TO ALL

A KIT TO GET YOUR HANDS ON THE MATERIAL



In parallel to the creation of the wiki, Aliapur wanted to be able to give direct access to Technigom, this material sold by industrialists and that the general public cannot obtain in small quantities.

The R&D department thus created a starter kit, composed of 3 bags of different-sized granulate and a can of adapted binding agent.

These kits were sent out free of charge to several fablabs and, at the same time, an evolving tutorial was put on line on the wiki to help with the manufacture of moulded objects. In return, the makers added their own experiences and substantiated results to the wiki, thus forming a virtuous circle, in short, and possibly leading to new, reliable and workable recycling solutions in the near future.

100 starter kits

Were sent out in 6 months to makers keen to work with tyre granulate in the fablabs.

The universe of collaborative creation for those who are curious, designers, makers... is a fantastic breeding ground for creativity. The world of waste in general is rather austere and opaque for this public, and the products made from recycled tyres are only known to an informed public.

Since its creation, Aliapur has shown a strong desire to open up and share its knowledge and expertise, particularly with Technigom, its granulate made from tyre rubber. The many studies carried out by the R&D department (characterisation, environmental impact, etc.) are available for download on the website. To reach out to makers, potentially capable of imagining new recycling solutions with this rubber, it was thus necessary to speak to them using a means of communication that they are familiar with and master.

This is why Aliapur has set up a wiki, a collaborative website whose content is open access and can be modified directly by the reader-contributors. The most famous example is the encyclopaedia, Wikipedia. But the wiki is also a privileged support for collaborative innovation, including in terms of sustainable development.

UNIQUE

At present, the open innovation approach as adopted by Aliapur with the use of a wiki and diffusion of a starter kit is unique in Europe in the recycling sector.

Aliapur's R&D department has thus put on line all its know-how regarding Technigom, from its properties to existing uses, for a global vision of the material and its possibilities. It then documented its own trials in fablabs, workshops that make computer-assisted tool machines available for the manufacture of objects (3D printing, laser cutting, waterjet cutting, machining centres, etc.). This has made it possible to obtain a relatively precise approach to the forms that can be made with this recycled material.

The participants in the first Openwaste creative marathon (see following pages) were naturally encouraged to consult this wiki before the event.

#OPENWASTE, THE FIRST SUCCESS FOR THE HACKATHON DEDICATED TO WASTE

The date was set for 24 November 2017, on Aliapur's initiative, at the TechShop Leroy-Merlin in Paris-Ivry for the first hackathon dedicated to waste.

Confirmed experts and mentors

Ademe, Zerowaste (a zero wastage/zero waste approach), Design & Human, Centre Français du Caoutchouc et des Polymères (the French centre for rubber and polymers, CFCP), Syndicat national du caoutchouc et des polymères (the French national union for rubber and polymers, SNCP), ECO-TLC (eco-organisation for textiles, linen and shoes), Renault Creative Lab, Open Street Map (international project for open access world geographical data), Elastolab (incubator for start-ups)

For 3 days, 37 designers, engineers, and creatives, all passionate about innovation and the environment, shared a single ambition: finding innovative solutions to respond to recycling issues by "hacking waste" with just one imperative, using a significant volume of material without generating any additional environmental impact. Result: a first success with, as the Aliapur team out in force at the event, and particularly Jean-Philippe Faure, the R&D director, were able to observe, "a great deal of enthusiasm and creativity from the 7 teams formed on site, and a good dose of ingenuity in the projects presented to the jury! This success, we obviously owe it to the 37 makers, but also to the many experts and mentors who came throughout this weekend to give advice and help the teams learn how to use the material in particular".

PROMISING SOLUTIONS

From connected urban slabs that produce energy, to the desk set made from recycled material, from the survival kit for situations of conflict or natural disaster, to protections for urban furniture, there were 7 projects prototyped within the TechShop workshops.

Tyre granulate was thus a particular source of inspiration for makers such as Lou Vettier, from the Towards team and whose project arrived in 3rd place at this hackathon. "We started thinking about projects based on end-of-life tyres when we found out that Aliapur was going to let us reappropriate the material during this event". "These recycling issues, beyond being fashionable, are meaningful and these three days particularly inspired us," specified Henriette Hippomène, a member of the 2nd placed Flower Power project. "As a plastics engineer, for me tyres seemed to be a rather classic material. My vision changed though, because the possibilities for transformation are promising and the characteristics of the material, notably its rot-proof quality and acoustic performances, make it very interesting."



3 PROJECTS COMMENDED, 1 WINNER

At the end of these 3 days of rich and intense exchanges, the jury commended 3 projects which succeeded in demonstrating their capacity for innovation and their potential for development: "Flower Power", a connected window box that filters rain water, and "Towards", a survival kit for emergency situations, which placed 2nd and 3rd respectively at this hackathon. For each of them, the adventure continues: the Flower Power project is in the technical maturity phase and the Towards team "hopes to make contact with the representative of the Ademe we met at Openwaste to study the technical and logistic questions. A dossier will also be presented to certain foundations with the aim of working at a larger scale and finding funds."

But every competition has a winner, and for this first edition of Openwaste, it was the Black Pillow project that came out on top. Its maturity, its potential for industrial development and its capacity for using a large volume of material were particularly attractive to the jury. Black Pillow is a project for protecting urban furniture, thus guaranteeing better security for users. For the members

of the winning team, "the aim was to work on a security project, focusing on the urban milieu, and promoting the elastic capacities of rubber. The aim of Black Pillow is to cover metal posts with a casing to absorb shocks, extend the life span of urban equipment and also provide it with a slightly more aesthetic touch."

Black Pillow will now benefit from accompaniment by Aliapur in its development approach. "Several meetings have been organised with the Aliapur teams," explains Paul Couderc, a member of the team. "We plan to work with their partners to use the vulcanisation process which would allow us to not denature the material. It is positive for us to continue developing our project, while also receiving real accompaniment. Openwaste is not just a façade, there is a complete approach behind this event, which is a real launch pad for us today."

The prizes were awarded to the winners by Mark Thys, the CEO of Aliapur, and Jean-Charles Caudron, the Ademe's Head of Product and Material Efficacy Department, who was the president of the jury for this first edition.

Given the success of this first edition, the Openwaste 2018 hackathon is already in preparation.



VISIOPUR, 10 YEARS OF EXCELLENCE FOR THE QUALITY OF SHRED

Recovering energy from tyres is an alternative solution to the fossil fuels used in the cement industry since the 1970s. With their stable composition, a calorific value equivalent to that of coal, and almost identical to that of petroleum coke, end-of-life tyres are a replacement fuel that is both appreciated and sought-after. Depending on the specificity of their factories, cement manufacturers – both in France and abroad – require particular shred formats. But they all share the same requirement: identical quality and homogeneity of the products at each delivery.

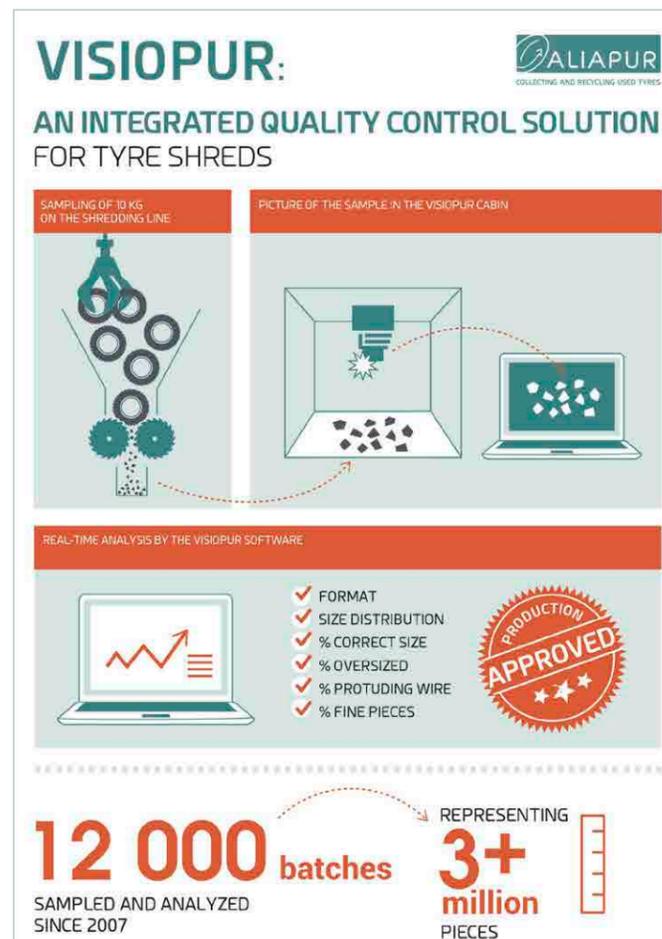
To satisfy this requirement, Aliapur has carried out quality controls on all the transformation sites (shredding platforms) in the sector since 2007. These controls are guaranteed by an internal, patented solution installed on each site: Visiopur, which is both a device and measurement software. Visiopur makes it possible to verify the conformity of batches of shred, regularly and randomly sampled from the production lines, with the different formats proposed by Aliapur. In a decade, 12,000 batches of shred and 3 million parts have been measured. The data collected have made it possible to homogenise the production of shred, and to propose a similar product regardless of the transformation site in which it was produced or the type of shredder used. Visiopur is a tool that is permanently evolving. In 2017, the online version of the software was deployed: measurements are now made via an internet interface (and no longer on a dedicated computer), and the results are transmitted in real time to Aliapur.

30%

...less CO₂ emissions, that is what using tyres as fuel makes possible, compared to coal.

Aliapur shred exports in 2017

Germany, Austria, Spain, the Netherlands, India, Japan, Luxemburg, Morocco, Pakistan, Poland, Portugal, Sweden, Switzerland, Turkey.



URBAN HEATING: SWEDEN FIRST, FRANCE NEXT?

In Sweden, 8 flats in 10 are served by a heating network. The country is the most advanced in Europe in the development of renewable and recovered energies. According to a study by the Ademe (Les chiffres clés 2013 climat, air et énergie), "the share of these energies in final energy consumption is almost 50%, whereas it reaches barely 15% in France". It is true that the Swedish authorities work actively to attain independence from nuclear energy and oil, focusing on an energy efficiency policy that both respects the environment and is in conformity with the social expectations of its citizens.

In Norrköping, a city of 140,000 inhabitants situated 160 km south-west of Stockholm, the local urban heating system serves more than 90% of homes: and as many consumers who have clearly shown that their priority is using energy that is not of fossil origin. Managed by the German energy giant, E.On, the thermal power plant thus tried to find alternative solutions: and it is now one of the two urban heating plants in the country that uses end-of-life tyres. In Norrköping, tyres have been used since 1995, or 2 years before wood, even though wood is a Swedish specialty! Every year since 2008, Aliapur has provided the factory with 8,000 tonnes of tyre shred: the sector has been recognised for

its ability to deliver products of constant quality and with no disruption in supply. Beyond this exemplary collaboration, it is above all a recycling method that has proven its worth, discretely but surely, for a decade.

In October 2017, a delegation from Aliapur visited the site and invited the Ademe to join them. As tyres are a useful, practical and even sought-after fuel source in Sweden, there is no obstacle to integrating them in turn into French urban heating plants, like other forms of waste, even though these other forms are less effective in terms of calorific value. Above all, this would be perfectly in line with the energy transition policy encouraged by the authorities. Aliapur hopes that the urban heating plants that will be built – or renovated – in France in the coming years will be capable of integrating these data, supported by the Ademe.



AT THE HEATING PLANT IN NORRKÖPING...

- 1 boiler in 5 uses tyre shred, mixed with wood (natural and from deconstruction).
- The shred from the Aliapur sector was produced specifically for this factory, whose specifications demanded a size of less than 110 mm.
- Daily shred consumption can attain up to 120 tonnes per heating day.
- Coal is only used when the outside temperature settles at less than 8°C.

GRANULATE: THE QUALITY SURVEY FOR THE FUTURE TECHNIGOM

In spring 2017, Aliapur ordered a comprehensive quality survey of the granulate produced by the 6 industrialists working in the sector – all European, including two in France: HET and Delta Gom. In addition to the regular random samples carried out for testing every year, this was the second time that a study of this magnitude had been conducted. It was to verify the regularity of the product manufactured, its purity, the extent to which it respects standards, and its conformity with the granulation process.



1,5 kg

of granulate was sampled from each big bag for analysis: 500 g from the bottom of the bag, 500 g from the middle and 500 g from the top. This was essential for verifying the average size of the granulate from a single big bag.

Above all, this survey was carried out anonymously: Aliapur wanted to obtain a perfectly precise appreciation of the granulate produced with the rubber from the tyres collected in France by Aliapur's service providers. To do this, "big bags" – tyre granulate sacks containing 500 kg or 1 tonne – were purchased by a company assigned for the purpose, Béton Direct.

The sampling for the in-depth study was carried out by an independent laboratory, Labosport, in the presence of a member of Aliapur's R&D team and under the control of the engineering consultancy firm, Julien Lebourgeois, which specialises in accompanying companies in their search for innovative solutions. This quality survey started when the big bags were ordered, with a qualitative analysis of the customer service of all the granulators, their tariffs and conditions, and their delivery times. All the big bags were stored identically and the same samples were taken. Seven types of data were then analysed for each sample: particle size, metal content, fibre content, impurity levels, humidity levels, apparent density, and analysis of the PAHs (polycyclic aromatic hydrocarbons). The results of this survey showed that the 6 industrialists studied all provide products that are in conformity with the quality requirements demanded by Aliapur. It should be noted that the results of the two French granulators, Delta Gom and HET, were particularly close and linear. It was the results of this survey that convinced Aliapur to create the Technigom label, for the tyre granulate manufactured in France, and only for tyres collected from car industry professionals, and produced at 95% by premium manufacturers.

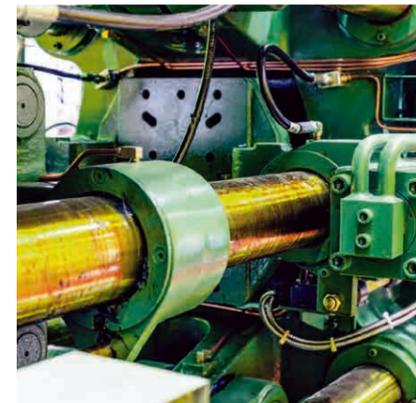


INPPURPLAST: READY-TO-USE BLENDS OF RUBBER AND PLASTICS

The collaborative research project InPPURPlast (*Intégration de poudrettes de pneus usagés recyclés dans les plastiques – integration of recycled end-of-life tyre powder into plastics*) was launched in October 2016 for a duration of 30 months.

30

formulations have been tested, with various plastics and a range of quantities of granulate. Each time, the physical characteristics of the compound obtained were studied (resistance, elasticity, etc.).



The aim of InPPURPlast is "to develop compounds on plastic bases that integrate tyre powder for direct exploitation": it was thus a question of finding large-scale commercial outlets for tyre powder by including it in plastic matrices. The idea is to offer industrialists ready-to-use blends that they will be able to use on hot shaping tools: injection, extrusion, roto-molding, thermoforming, etc. Promising trials have been carried out throughout the year, some with just a few hundred grams and others with several dozen kg, on industrial and semi-industrial production lines, in order to produce parts for a variety of different uses, for example flower pots or hollow parts for roto-molding.

The results show that it is already perfectly feasible and profitable to produce compounds containing 50% of tyre powder mixed with polyethylene and polypropylene, and the aim for 70% of powder with the same plastics is an industrial possibility.

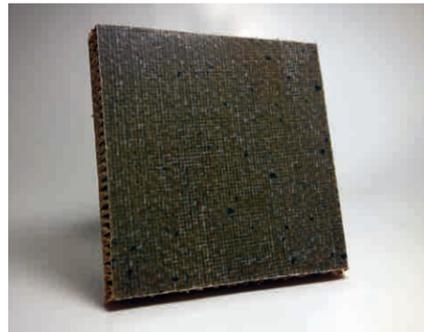
In addition, the mechanical characteristics of the compounds have made it possible to highlight interesting properties: these compounds are stable and can be delivered ready-to-use at a cost-effective price. Above all, they should make it possible to manufacture products with exceptional elasticity and shock resistance properties. The industrial applications for this new tyre powder recycling method are thus theoretically infinite. The trials carried out in 2017 with these compounds must nevertheless be confirmed at a larger scale in 2018, before envisaging commercial production.

NATURAL MATERIALS AND RUBBER: BIOCOMPOSITES HAVE A BRIGHT FUTURE

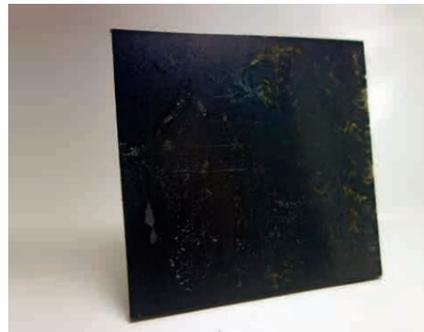
On the one hand, bamboo, coconut fibres, flax fibres and basalt – natural materials, in other words. On the other, Technigom, the tyre rubber granulate – a recycled product. If you combine them, the result is a completely original composite or, better still, a biocomposite. This is the particularly innovative project on which Aliapur and Veso Concept started working in spring 2017.



Bamboo and Technigom



Basalt and Technigom



Coconut fibres and Technigom

Created in 2008, Veso Concept is a mechanical engineering research and development office specialising in biosourced composite materials. It is notably the initiative behind new applied research concepts developed around eco-composite materials. In this context, using Technigom makes perfect sense, logically opening the way for an association with Aliapur for collaborative projects.

Technigom, which is produced exclusively by granulators under contract with Aliapur, is a material whose flexibility, resilience, heat and sound insulation, solidity and rot-proof qualities make possible a vast array of explorations to design biocomposites with natural materials. For the teams from Veso and Aliapur, it was thus natural to manufacture composites with high added value for top-end industries. This collaboration has made it possible to develop 4 composite panels: a basalt panel with Technigom in its honeycomb, a bamboo panel with a Technigom core, and two laminate panels mixing Technigom granulate with coconut fibres in one and flax fibres in the other.

There are multiple possible applications for these panels, for example damp-resistant, waterproof partitions for the shipbuilding industry, parts with increased shock-resistance properties for the car industry, sound and heat insulation for the construction industry, a flexible, solid, long-lasting and recycled material for furniture and design... In fact, there are so many possibilities that each in situ test suggests other potential new applications: the history of biocomposites that associate natural materials and Technigom has only just begun.

TOGETHER JEC WORLD 2018

Aliapur and Veso Concept decided to exhibit together at the JEC World 2018, the world composites trade show, held at the Parc des Expositions in Paris-Villepinte from 6 to 8 March 2018. On this occasion (see facing page) Aliapur chose to focus its communication on its product, Technigom, via a specific message aimed at an international public of industrialists, researchers, engineers, marketers and purchasers.
Dedicated landing page: technigom.aliapur.fr



A TOTALLY RECYCLED MATERIAL FOR BIO COMPOSITES.



-  **Environmental Performance**
Sustainable material
Substitution of fossil fuel based polymers
Substitution of natural rubber
Saving of CO₂ emission
-  **Economic Performance**
Cost efficiency with high quality product
Acoustic optimization
Shock absorption layer
-  **Durability**
Long term performance
Traceability
Constant quality

TECHNIGOM is a **NEW** raw material for biocomposites, made of **rubber** obtained from the end-of-life tyre recovery sector.

The environmental, technical and economic performance of **TECHNIGOM** will result in new innovations in the composites sector.

TECHNIGOM has acoustic, shock-resistance and energy properties leading to a multitude of possible applications in a wide range of industries, such as ship-building, car manufacturing, construction, design and furniture. And more.



HIGH TECH GROUND COVERINGS BEING EXAMINED IN LYON

Requalifying the vast, emblematic district of La Part-Dieu, in the heart of Lyon, is a complex, long-term urban project. The idea is to redesign the areas dating from the 1960s and 1970s, revegetating them intensely and making them pedestrian for the most part. In early 2017, before undertaking this large scale rehabilitation work, Grand Lyon, the general contractor, wanted to test different types of ground covering.

The trials were entrusted to the engineering and public works firm, Maïa Sonnier, on a plot situated in a discreet street just a stone's throw from the mainline railway station. Two experimental areas were set up, one with a variety of granite slabs, the other with a dozen different types of covering. For the granite slabs, the aim was to test the elastic joints: these joints need

to be capable of resisting abrasion and of remaining flexible enough to contract or distend depending on the variations in temperature, thus protecting the stone from the possibility of cracks. The work was entrusted to the company Roccatech which, in association with Aliapur, tested in situ a joint containing tyre granulate, a product with characteristics perfectly adapted to the requirements. It was only for aesthetic reasons that this joint was ultimately not chosen for the project, but the results were convincing enough to encourage Aliapur and Roccatech to continue working together on this promising concept. On the other plot, 12 different types of covering were installed: the tests focused on their ability to combat heat. The bitumen and concrete generally used in urban settings effectively have the unfortunate tendency in summer to accumulate heat during the day and release it at night, which exacerbates the intensity of a heat wave. An alternative solution is necessary. Tests were carried out on classic surfaces, natural or pigmented stone, and even vegetated stone. As the plots had to be both insulated from the ground and from each other, Aliapur provided an insulating infrastructure: moulded struts made from tyre granulate and a loose, granulate layer as the underlay, making it possible to install the sensor cables for continuous measurement of the temperature of each batch. The tests lasted until the end of 2017.



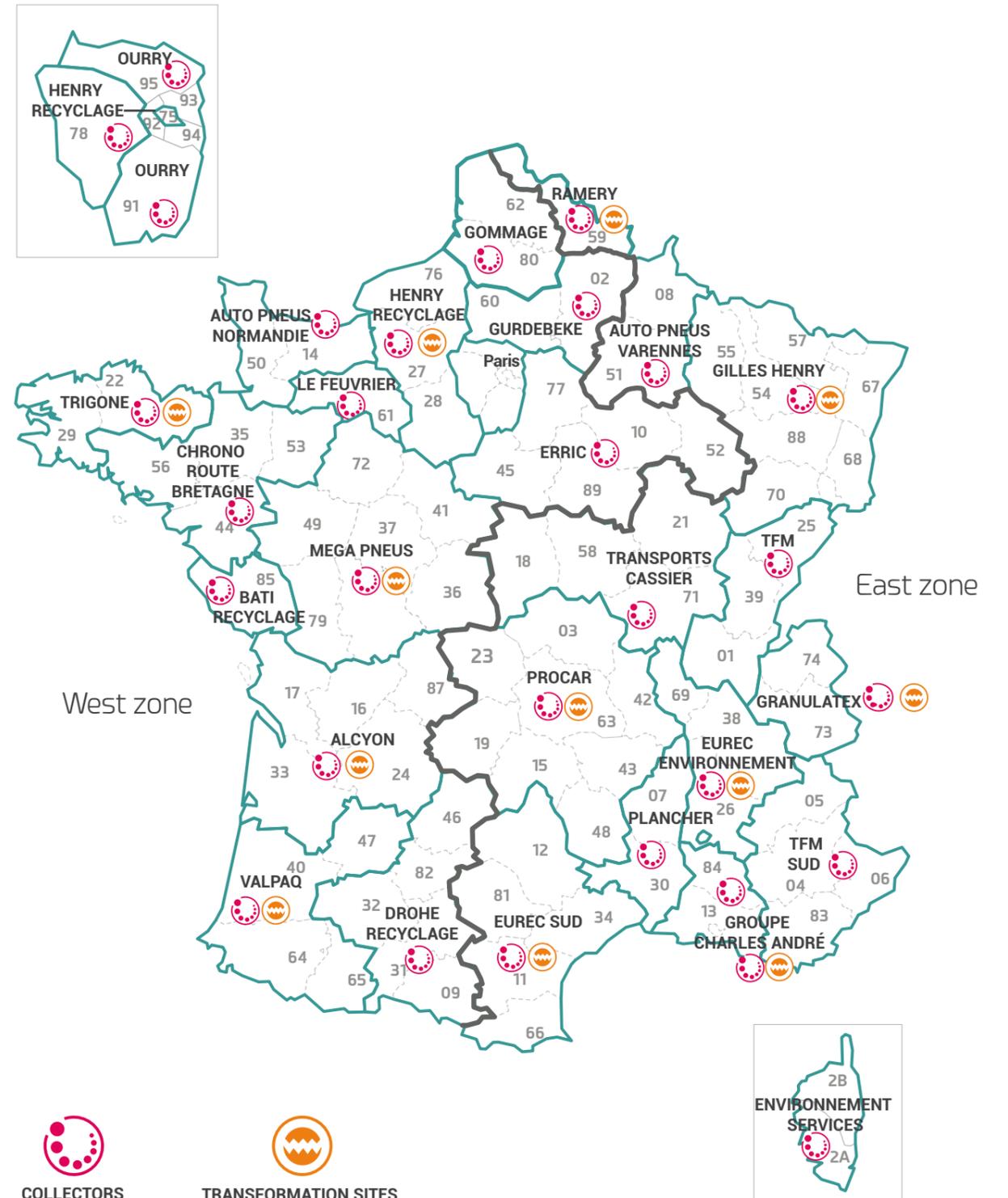
For the ground covering tests for the future Part-Dieu (Lyon) site, Aliapur provided an insulating infrastructure made from tyre rubber.

TYRES AT THE SHOOTING RANGE

The project is an original one: finding an alternative solution to the mounds of earth placed on shooting ranges, designed to collect the bullets fired. This unusual request reached Aliapur in summer 2017 and came from a shooting range in the Drôme département. In the end, it resulted in a collaboration that was as fruitful as it was original.

The ground at the firing points is effectively polluted with bullets, requiring regular – and costly – depollution. Not only was tyre shred an effective replacement for the earth that stops the bullets, but also the bullets thus finished their trajectory at the back of a mound of shred, making it easier to recover them. In parallel, we observed a considerable decrease in dust emissions. One thing led to another, and the exchanges between Aliapur and the managers of the shooting range led to a second project: working to reduce the noise pollution of the site. As tyre rubber is an excellent material for sound-proofing, Aliapur had all the walls of the range covered with mats made from granulate. The initial results revealed a significant decrease in noise. These results will be optimised in 2018 with the installation in situ of whole walls of thick acoustic bricks made from Technigom rubber. A new recycling method that is worth keeping an eye on...

ALIAPUR'S SERVICE PROVIDERS



TECHNIGOM

by ALIAPUR

LE SEUL REMPLISSAGE DE GAZON SYNTHÉTIQUE
CERTIFIÉ ORIGINE FRANCE



TRAÇABILITÉ & QUALITÉ

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TECHNIGOM, c'est la garantie d'un produit pur et calibré, dont la qualité est contrôlée par des laboratoires indépendants. **TECHNIGOM** est fabriqué sur-mesure en fonction du cahier des charges de chaque client.

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