SUSTAINABLE DEVELOPMENT REPORT 2016
Adisseo is a signatory to the Responsible Care global charter and, as such, is committed to safe management of its products throughout their lifecycle, the promotion of their role in improving quality of life and their contribution to sustainability.

How does sustainability fit in with the business activities of Adisseo?

We have a very clear vision of our mission. It is based on an equally clear fact: by 2050, the world’s population will have risen to more than 9 billion. Feeding this population is one of the major challenges of our time. So our mission will be to provide the world with healthy, sustainable, affordable, high-quality food without compromising the principles of sustainability. To succeed in this mission, Adisseo has positioned itself as a key stakeholder central to the animal protein production chain. And sustainability is critical to this production chain. The very essence of what we do at Adisseo as a provider of nutritional solutions is to improve the conversion of plant proteins into animal proteins. Producing these proteins consumes the majority of crops grown in the world, thereby generating a demand for productive land, driving the substantial use of plant protection products, and consuming large amounts of water and energy. The very nature of our business is to improve meat production in ways that reduce our dependence on these natural resources.

How do you incorporate this approach into your own manufacturing environment?

We focus our work on the three priorities of safety, the environment and people. Because we are essentially chemists operating in sensitive locations, safety has always been a non-negotiable priority on which we never compromise, whether in our own production plants or in the use of our products.

Environmental considerations are now of equal importance and priority. We must work towards zero environmental impact. For example, we have already reduced our water consumption significantly. We are also investing in technologies to manage and eliminate the odors generated by our production activities, which represents a highly complex area of research. And, we have also embraced innovations in energy by contributing to the construction of a biomass plant at our Commentry facility to provide 50% of the steam needed by the plant, at the same time as developing a new strand for the local economy.

People represent the third key value for Adisseo. In fact, we have made the satisfaction and commitment of our people a key indicator of company performance. We measure that indicator precisely, and develop initiatives alongside our teams to ensure that we progress every year in this crucial area that governs our success in every other part of the business.

So what are the solutions you contribute to achieving that?

If we continue to produce meat in the same way as we did 50 years ago, there will not be enough productive agricultural land to feed the world’s population. But we are improving this level of production through nutritional expertise, animal genetics and livestock management. The quantity of feed required for the growth of a chicken is, for example, substantially less today than it once was. If we add around 2 kilos of methionine to a tonne of feed, we can optimize the growth of that animal. Similarly, we will improve digestion with enzymes, which reduces livestock farm waste, and the choice of raw materials based on their nutritional value by using a service like Precise Nutrition Expertise or PNE.

“OFFERING OUR WORLD HEALTHY, SUSTAINABLE, AFFORDABLE & HIGH-QUALITY FOOD”

Interview with Jean-Marc Dublanc, Chief Executive Officer of Adisseo

Given that animal feed is the largest single expense for livestock farmers, this has an important economic effect, and can make farming profitable in challenging regions, such as Africa, where we also support an aid program for chicken farming families.

“We must work towards zero environmental impact.”
Adisseo is a global leader in the production of additives and nutritional solutions for animal feed. The group is No. 3 worldwide, and is the second largest methionine producer as well as leading the market in protected methionine for ruminants. The mission of Adisseo is to offer our world healthy, sustainable, affordable, high-quality food by providing the animal feed and food industries with innovative products and services. Adisseo is committed to distributing the value it creates fairly between its customers, employees and shareholders. Additionally, Adisseo invests actively in research, in its industrial production base, in environmental protection and in the development of its teams and people. Adisseo became a subsidiary of the Chinese Bluestar Group in 2006, and has continued to increase its labor force and financial results. It is also the first international company to have its shares traded on the Shanghai stock market.

**Key Figures**

- **1,900** employees worldwide
- **€1.469 billion** in revenue
to end September 2016 extrapolated
- **+160** researchers
- **€880 million** invested since 2010
- **7** in-house research centers and many external research contributors
- **7** plants in France, Spain and China
- **2** manufacturing centers (Europe and Asia) and multiple industry partnerships
- **+2,500** customers in more than 100 countries

**Our Values**

- **Creativity** Which opens new paths to progress and new ways of succeeding together.
- **Team Spirit** Which unites us in our successes and challenges.
- **Integrity** Which underpins our interaction with customers and partners, ensuring that our actions are consistent with our words and values.
- **Responsibility** Each of us is a stakeholder in the company and a contributor to its success. We encourage decisiveness, a sense of urgency, courage and delegation.
- **Results-focused Culture** Which makes our actions effective and measurable, because we understand that success is built on the quest for performance, continuous improvement and listening to our customers.
Adisseo has shown that adding a liquid source of methionine, Smartamine® (D, L-HMTBA), can deliver energy performance while reducing nitrogenous discharges into the environment. Recent studies* conducted by Adisseo show that adding a liquid source of methionine for poultry and pig feeds. It improves technical and economic performance while reducing nitrogenous discharges into the environment.

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* Rhodimet technical report No. 6 09/2016

### > SEVEN FAMILIES OF PRODUCTS FOR SUSTAINABLY BETTER ANIMAL NUTRITION

**Rhodimet®**
- A preferred product for limiting antibiotic residues in the environment.
- Offers a regeneration service for reducing the carbon footprint of their products.
- Adisseo relies on a high level of upstream integration to secure its methionine value chain.
- Sulfuric acid is one of the most commonly used compounds across a broad spectrum of industry sectors. So in addition to ensuring its own security of supply, Adisseo also provides this product to external customers.

**Smartamine®**
- A preferred product for limiting antibiotic residues in the environment.
- Provides an economical solution to achieve the correct electrolytic balance of feed for monogastric animals, and provides a source of sulfur easily assimilated into ruminal feeds.

**Microvit®**
- Improves the digestibility of the plant-based raw materials used in poultry and pig feeds, contributing to a more environmentally friendly model for livestock farming.
- With multi-species, multi-ingredient and multi-application solutions, Rovabio® is the most versatile enzyme product on the market today.

**Rovabio®**
- Rovabio® is a range of enzymes (Advance, Excel and Max) that improves availability at the right point in the digestive tract.
- Adisseo manufactures and sells the two market-leading brands of methionine, Smartamine® and MetaSmart®. These nutritional solutions are essential for ensuring that dairy cow rations contain the correct amino acid balance.

**Selisseo®**
- Selisseo® 2% Se is the innovative source of organic selenium developed by Adisseo from seleno-hydroxymethionine. Selenium has been used for decades in animal feed for its well-known antioxidant properties.
- However, compared to more traditional sources of selenium, Selisseo® 2% Se delivers a better response to the needs of professionals for performance, reliability and convenience.

**AdiSodium™**
- AdiSodium™ is a source of chlorine-free sodium. It provides the quality and consistent reliability required to achieve the most demanding level of traceability. With Microvit®, Adisseo supplies its customers with a top-quality product, along with all the expertise and innovation needed for its strategic "premixer" partners to respond effectively to ongoing growth in what is an increasingly demanding market.

**Alterion**
- Alterion is a natural, non-GMO probiotic solution derived from a single strain of Bacillus subtilis, carefully selected by Adisseo experts and their partner Novozymes.
- Alterion improves absorption of digestive nutrients, optimizes feed usage, improves performance and reduces waste.
- Alterion also limits the presence of undesirable intestinal bacteria in poultry. As a result, it offers an excellent alternative to growth factor antibiotics, thereby reducing drug residues in the environment and in animal products for human consumption. It is therefore a preferred product for limiting the development of antibiotic-resistant bacteria.

Adisseo is the pioneer in monogastric animal nutrition. Adisseo manufacturers and sells all the necessary product, along with all the expertise and innovation needed to provide its customers with a top-quality product, along with all the expertise and innovation required to achieve the most demanding level of traceability. With Microvit®, Adisseo supplies its customers with a top-quality product, along with all the expertise and innovation needed for its strategic "premixer" partners to respond effectively to ongoing growth in what is an increasingly demanding market.

With Multi-vitamins, MetaSmart®, and MetaSmart®, Adisseo is committed to improving the quality of animal feed by offering nutritional products and solutions that contribute to livestock wellbeing, as well as promoting their growth, improving their health and reducing waste. The result is optimized performance for poultry, pig and dairy production worldwide.

*A PREFERRED PARTNER*

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* Rhodimet technical report No. 6 09/2016
Adisseo has developed a series of exclusive analytical and forecasting services designed to provide its customers with easy access to help and expert assistance on using its products and improving the nutritional quality of feeds.

For several years now, Adisseo has been engaged in a policy of continuous improvement covering every part of its business to boost customer satisfaction. The group applies the same policy to boosting the commitment of its people and maximizing the quality of all its stakeholder relationships.

To achieve this, Adisseo has introduced a totally new CRM (Customer Relationship Management) system to deliver an even faster and more effective response to customer expectations while boosting their satisfaction over the long term by simplifying its own business practices.

> More information on the feedsolutions.adisseo.com website

> SERVICES FOR GREATER NUTRITIONAL CONTROL

Adisseo has introduced a totally new CRM (Customer Relationship Management) system to deliver an even faster and more effective response to customer expectations while boosting their satisfaction over the long term by simplifying its own business practices.
Our priority

ZERO ACCIDENTS

The personal safety of our full-time employees, our temporary employees, the employees of external companies, visitors and neighboring communities is an absolute priority at Adisseo. The company has implemented a series of innovative systems to ensure constant vigilance and achieve its goal of zero accidents.

At Adisseo, every new project implemented includes an important safety component, and when multiple options are available, those that ensure maximum safety will always be chosen.

Adisseo, Usinai and Transaid

Making Adisseo expertise available to everyone

In 2015, Adisseo joined the French Usinai network, which advises industrial companies and government departments on how best to manage an incident or accident involving an olfactory chemical on an industrial site. Adisseo has volunteered its advice on 7 substances. Adisseo is also a member of the Transaid network set up to assist emergency services in handling transportation accidents involving hazardous materials.

> OUR COMMITMENT TO SAFETY

2016: safety results on target

In 2016, the accident with or without lost time frequency rate of 2.7 (equivalent to a TRIR of 0.54) is consistent with achieving our target. This result is one of the best in the industry, the two previous years were slightly better, which delivered our best performances. A series of special action plans are being rolled out throughout the company to improve results in 2017.

> Safety: records beaten on the majority of Adisseo sites

Adisseo’s plant located at Burgos (Spain) achieved 1,000 accident-free days in September 2016, and in December was able to report its third year in succession with no accidents. It’s a performance that the teams intend to keep up as they work towards their new goal of 2,000 accident-free days. Other sites have also achieved excellent results, including Nanjing (China) with more than 18 accident-free months, and Roches-Roussillon (France), which has achieved almost 500 days with no accident (493 days which is a new record for this site).

Two safety awards for Adisseo Spain

Adisseo Spain received the 2016 Safety Management Award presented by Coashiq (the Autonomous Commission for Safety and Hygiene in the Workplace for Chemical and Related Industries). This award specifically recognizes the 1,000 accident-free days achieved by the Burgos plant. The company also received the MC Mutual’s “Antonio Bari” annual award for workplace risk prevention.

SUSTAINABLE DEVELOPMENT REPORT 2016 – 11
> Our commitment to safety

3 million

invested in industrial site security during 2016

Securing our industrial sites

The terrorist attacks on France and the wider Europe in 2015 and 2016 have led to a significant tightening of security measures on Adisseo sites. These security measures are designed to protect people, property, products, processes and information systems against all kinds of criminal and malicious action (intrusion, theft, terrorism etc.), and to prevent cyber attacks. Adisseo has invested around 3 million euros to secure its industrial sites.

Working closely with the proper authorities, a series of measures have been implemented, including upgrading perimeter fences, developing new video surveillance resources, tightening security at sensitive points, and even modifying access routes to improve surveillance and limit the number of site entrances.

> Informing employees about security

As part of upgrading security at Roches-Roussillon, each employee received a guide explaining the different levels of alert, the resources implemented to prevent any malicious act, and what to do in the event of a potential threat. Employees were also advised to observe and report any unusual activity, but never to expose themselves to danger or take direct action.

> Talking safety with customers

Adisseo Commentry welcomed approximately twenty Health, Safety & Environment managers from the Avril Group. The Avril Group is an Adisseo customer, and France’s leading producer and financier of oils and vegetable proteins. As part of the visit, the Adisseo QHSE teams were able to demonstrate the safety expertise of the group, and plans are in place to continue the process of discussion around other Adisseo services, such as its safety training center and officially recognized inspection service (regulatory inspections of pressurized equipment for which the establishment is responsible).

Interview with Laurent Laskri, HSE Director, Avril Group

What overall impression did you take away with you from this visit?

One of useful discussions on all the subjects we covered. You were able to answer all our questions, and we went away with the impression of a company with demanding standards, where safety isn’t a constraint, but an integral part of your working methods.

Were there any aspects that particularly interested you?

Your approach to chemical hazards, who has immediate practical applications for us, the opportunity to receive support from your Recognized Inspection Service for some of our sites in France, and the services offered by your Safety Training Center.

Would you welcome more discussions of this type?

Definitely. We found it to be an excellent experience.

> Sharing safety good practices

Every year, Adisseo holds a safety day for all employees in all its manufacturing, research, administrative and sales facilities. As well as focusing on day-to-day safety at Adisseo, it also provides an additional opportunity to offer training, visits and discussion on the subject of safety and achieving the zero-accident target.

The Workplace Hardship Prevention Personal Account (Compte Personnel de Prévention de la Pénibilité or C3P) was introduced into French law in 2014, and is implemented by Adisseo France. The program allows any employee exposed to one or more workplace hardship factors (night working, exposure to hazardous substances, load handling, etc.) to collect points that entitle them to certain benefits, such as training for a career change, making a transition to part-time working or even taking early retirement.

In 2016, 328 employees of Adisseo in France are involved in this program, which is fully consistent with the corresponding preventive safety policy in place in all Adisseo entities.
A proactive policy of Health, Safety & Environment investment

Adisseo is one of the top investors in its industry. Since it joined Bluestar/Chemchina in 2006, the group has invested €1 billion: half in France and half in China. It has focused these investments on expanding its teams and working more closely with customers, improving production quality and quantity, developing its research capabilities and shrinking its environmental footprint.

In 2016 alone, more than €26 million was invested in workplace safety and the environment.

Our HSE operating expenditure, which includes an ever-increasing number of regulatory constraints (additional studies, higher taxes, etc.) is governed by a proactive HSE investment policy that has seen more than a 20 million invested annually in recent years. Every new industrial project is used to further improve our management of safety and environmental risks, and mitigate the impacts as part of our wider commitment to sustainable growth.

Our priority
INVESTING IN QUALITY & INNOVATION

Adisseo and Mangra combine their expertise

Adisseo and Mangra combine their expertise

Innovation for customers

The Rhodimet® Plug & Spray system is designed to add Rhodimet® AT88 (an analog of liquid methionine) to animal feed by direct injection into the feed component mixer. It is particularly suitable for feed plants using between 30 and 100 tonnes of Rhodimet® AT88 per year. The system has been specially designed for Adisseo by engineering company Mangra by combining and concentrating the expertise of both companies.

Innovation for customers

Developing with success one product/service or one process innovation

Adisseo and Mangra combine their expertise

Innovation for customers

> Producing more by consuming less

The Adisseo MACARON project aims to increase the production capacity of the Roussillon site methionine units by improving shop reliability and installing new equipment. Implementation of this project has also delivered a 25% reduction in water consumption at the Roussillon site. This significant saving has allowed Adisseo to secure a subsidy from the regional water authority.

G4-EC1
SUSTAINABLE DEVELOPMENT REPORT 2016 – 15
Guaranteeing supplies and jobs

The Adisseo acquisition of the Port of Bayonne Sulfur Terminal in France during July 2016 consolidates the upstream integration of its methionine production activity. The group has the resources necessary to improve the reliability, production costs and operating efficiency of the terminal to boost the competitiveness of the European methionine chain in its entirety, and therefore guarantee stability of supply to its customers.

It further strengthens Adisseo’s commitment to jobs, investment and sustainability in its local facilities. Up to €10 million will be invested here to upgrade site safety and environmental performance to industry best practice standards, and provide a secure future for local jobs.

Innovating for feed digestibility

In Rovabio Advance, Adisseo researchers have developed and perfected a new family of enzymes called Feedases. Feedases bring together all those complex enzymatic solutions that by their action deliver improved overall digestibility of animal feeds. This in turn allows our customers to reduce the quantity of feed they need to give their animals, and therefore to reduce the quantity of ammonia released into the environment. Since its launch in 2015, 13.5 million tonnes of feed have been treated with different forms of Rovabio Advance, which is represents 3 billion chickens or the equivalent of 5.5 million tonnes of meat.

Creating new processes

ANTARES (Adisseo Nanjing Treatment of Ammonium sulfate by RESin) is a project designed to optimize the ammonium sulfate unit operated by the Adisseo Nanjing site in China. The plan is to use a semi-continuous, 3-stage, resin-based process to separate the sulfated organic molecules (chiefly HMTBA, the main molecule used in AT88) from the ammonium sulfate solution (AS). The HMTBA will then be recycled into the AT88 process to boost production efficiency and improve AS quality in terms of particle size, acidity and odor. Run by the Nanjing R&D team, this project recently entered its pre-production phase. As a nominee in the R&D category, the ANTARES project took bronze in the 2016 Innovation Awards for Franco-Chinese Teams.

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Diversifying methionine production: ADRY+

After more than a year of work and the finalization of preliminary studies, the ADRY+ project entered its decisive phase midway through 2016. This strategic project will enable Adisseo to expand the market for Rhodimet® AT88 liquid methionine.

This new powdered version of the product is a calcium salt of Rhodimet® enriched with AT88 to deliver the benefits of this product (the same efficacy value > 88%) to customers whose process cannot use the liquid form of methionine.

The new ADRY+ production unit is under construction at the Adisseo Burgos plant, consolidating the long-term future of the site and creating more jobs. Designed to incorporate many aspects of sustainability, it optimizes energy consumption (by recycling waste steam), reduces CO₂ emissions and imposes the minimum possible level of environmental impact. A special waste process air treatment plant is integral to the new facility, and is designed to eliminate any odors with the potential to impact negatively on neighboring communities. The investment in this odor treatment system - which was not an obligatory requirement - accounts for around 7% of total investment in this project.

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> OUR COMMITMENT TO SOCIAL RESPONSIBILITY

Our priorities

SHARING & CARING

At Adisseo, the commitment of its people is a key performance indicator alongside safety and financial results. With more than 1,900 employees worldwide, Adisseo is a net creator of jobs. In 2016 alone, the company hired more than 170 new people across the 50 distinct disciplines that define its rich diversity. Looking beyond its own people, Adisseo is also committed to developing close relationships with academic institutions, non-profit organizations and its neighboring communities.

Contributing to local communities is a priority for all Adisseo operations around the world. Caring for others in a mutually supportive way is another Adisseo value, along with supporting the employment of disabled workers and helping livestock farmers in impoverished regions of Africa are also central to the Adisseo spirit.

Listening to employees to gain their commitment

Since 2014, Adisseo has conducted a wide-ranging biannual satisfaction survey to gather the opinions of all its employees. The outcomes have led to practical initiatives designed to respond directly to the expectations expressed. In 2016, 1,620 employees completed the 71-question, 13-subject online survey. The latest survey also included the new indicator of ‘employee commitment’, a more demanding measure than ‘employee satisfaction’.

The results of the 2016 survey show that the levels of employee satisfaction and commitment are rising, which is the prime goal of the initiatives introduced so far. In overall terms, Adisseo has made progress in 10 of the 13 areas surveyed, and in half of those, the company is also seen to be performing on a par with, or better than, other companies in its industry. Commitment to quality and customer service is significantly higher. Other opportunities for improvement are also being pursued in local-level management and shop-floor communication. Programs like Agile and We Move are already helping us to improve in this direction.

> On-the-job training

On-the-job training delivers a direct response to an expectation expressed in in-house surveys. This type of training helps to improve the safety and reliability of facilities and the organizational structure. It also facilitates the transfer of knowledge and skills between employees. An ambitious program was launched in 2016, beginning with Roches Roussillon and Commentry. It includes a definition of the basics of the job, the training programs available, the testing of digital solutions for easier delivery of training and the Adisseo College project to provide permanent on-demand access to training and experience sharing.

Adisseo & employee support launched in 2016, beginning with Roches Roussillon and Commentry. It includes a definition of the basics of the job, the training programs available, the testing of digital solutions for easier delivery of training and the Adisseo College project to provide permanent on-demand access to training and experience sharing.

> Wellbeing in the workplace

More and more initiatives are now being implemented. For example, the medical service at Adisseo Commentry now offers employees the opportunity to engage in personal consultations with a psychologist as part of an initiative to provide a more comprehensive level of support. The psychologist works in tandem with the company physician, and consultations are booked directly with the psychologist to maintain the correct level of professional confidentiality.

To achieve an employee commitment rate (77%) in a context of organizational and cultural change

Training at Adisseo in 2016

(in Europe by employee and professional category)

*Workers, Technicians, Supervisors (non-management)

| Total number of employees by region in 2016 |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| Total number of employees in 2016 | Number of employees | Total number of employees | Total number of employees | Total number of employees |
| 1,904 employees | 1,828 | 1,804 | 1,828 | 1,804 |
| 1,382 | EUROPE, MIDDLE EAST, AFRICA, CIS | 1,382 | 1,382 | 1,382 |
| 396 | CHINA | 396 | 396 | 396 |
| 59 | ASIA-PACIFIC | 59 | 59 | 59 |
| 37 | NORTH & CENTRAL AMERICA | 37 | 37 | 37 |
| 30 | SOUTH AMERICA | 30 | 30 | 30 |

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| Total number of employees in 2016 | Number of employees | Total number of employees | Total number of employees | Total number of employees |
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| 396 | CHINA | 396 | 396 | 396 |
| 59 | ASIA-PACIFIC | 59 | 59 | 59 |
| 37 | NORTH & CENTRAL AMERICA | 37 | 37 | 37 |
| 30 | SOUTH AMERICA | 30 | 30 | 30 |
Facilitating employment for people with disabilities

Providing support for people with disabilities is integral to our Corporate Social Responsibility (CSR) policy. Adisseo employs people with disabilities, and encourages its subcontractors to do the same. Every year, our sites play an active role in European Disability Employment Week by hosting discussion and information meetings with its own employees and/or external contributors to develop the integration of disabled employees into the company.

“Having your disability recognized makes it easy for your work colleagues to understand. It’s also allowed me to have my workstation adapted so that I can carry on in the job.”

AN ADISSEO EMPLOYEE

Promoting sustainability at Adisseo

Adisseo launched its Sustainability Week in 2016 to promote awareness of sustainability and motivate its people to sustainability initiatives. May 30 to June 5, 2016 saw the third of these events worldwide, with local projects underway in every entity (lunches featuring organic and local produce, the presentation of individual initiatives including biodiversity, carbon footprint, etc.) and group initiatives (European suggestions boxes, the launch of the sustainability awareness module, etc.).

Supporting chemistry education

Every year, Adisseo attends the Chemistry Village careers fair in Lyon and Paris. The Lyon event in February 2016 proved highly successful:

“Having your disability recognized makes it easy for your work colleagues to understand. It’s also allowed me to have my workstation adapted so that I can carry on in the job.”

AN ADISSEO EMPLOYEE

Encouraging vocations

The National Chemistry Olympiad was introduced in 1984 to interest final-year school students in chemistry and attract the most talented of them into industry careers. Adisseo Commentry Plant Manager Emmanuel Goldberger presented the Académie de Clermont-Ferrand First Prize to Oscar Jozon, a final-year science student and the Lycée Descartes high school at Cournon in the Auvergne region of France first performance in coming first in the regional contest. The involvement of Adisseo in this important competition underlines its commitment to encouraging top students to take up a vocation in the industry.

Showcasing careers at Adisseo

Six chemistry teachers from the Lycée de Montluçon high school in France attended a one-day immersion course at the Commeny site. A perfect opportunity to highlight its commitment to pre-university education. Every year, Adisseo hires around 15 young people under work/study courses, and provides training for around 40 trainees. By inviting these teachers into its facility, Adisseo hoped to bring the world of education together with the corporate world to create a better understanding of the company’s needs and challenges, and contribute towards a better education for young people.

Opening the doors to our production plants

On Tuesday, October 4, 2016, around a hundred students from Agropariso Tech (the Paris Institute of Technology for Life, Food and Environmental Sciences) toured the Adisseo plant in Commeny. The visit excited a lot of interest among these future animal nutrition decision-makers, who may also be our future customers or colleagues.
Discovering China

The 27th Bluestar Summer Camp ran from July 19 to August 11 during 2016. Ten children of Adisseo employees participated in the opportunity to travel to China and take part in a host of activities. Skiing, an introduction to Chinese culture, swimming, flag football and a visit to the Great Wall of China were just some of the experiences in their packed program!

During the year, Adisseo China visited the Social Wellbeing Institute for the elderly in Shanghai Pudong New Area. The aim of the visit was to donate 80 boxes of Sheng Mu organic yogurt with a total value of ¥ 25,000. Adisseo China plans to develop this policy of donation going forward, as part of making an active contribution to social welfare in the region.

Adisseo is an active supporter of Elevages sans Frontières (Livestock without Borders), a nonprofit organization that provides vulnerable farming communities with the guidance they need to improve their lives by setting up revenue-generating livestock businesses. The involvement of Adisseo staff is intended to help fund the poultry segment of a multi-livestock breeding program in Benin. The ultimate goal here is to bring about lasting life improvements to around 1,000 families through the promotion and development of communal animal husbandry.

In return for each animal received at the start of the project, the families involved agreed to donate another animal reared by themselves to another struggling family, thereby initiating a virtuous chain reaction.
Our priority

REDUCING OUR ECOLOGICAL FOOTPRINT

Every year, Adisseo conducts new surveys and initiates new projects to reduce the environmental impact of its activities. From the supply chain to the water and energy consumption of production plants, office buildings and sales activities, every part of Adisseo is covered by the company’s environmental policy. Adisseo strives to take the innovative route to addressing these issues, such as the use of biomass as a fuel source for its Commentry plant.

Adisseo and the BPZ5

Adisseo receives an award for its green transportation

On December 7, Adisseo received a Bureau de Promotion Shortsea Shipping (BPZ5) of France award for its conscious decision to opt for alternatives to road transportation. For example, 85% of containers bound for export markets from France use intermodal routes; and the figure for Spain is 100%.

Our commitment to the environment

Business volumes significantly higher than in previous years

The business index illustrates the trend in production volumes at our Commentry, Roches-Roussillon, Burgos and Nanjing sites. Business volumes increased strongly in 2016 as a direct result of the ramp-up of the new methionine production facility in China, reliability improvements in European units. This trend should be viewed in light of closely controlled environmental results, many of which show an improvement over the period.

Activity index

(2012 reference)

80 90 100 110 120 130 140
100 100 121 121 134

The Nanjing plant has reduced its total volume of wastewater discharges by more than 20% in two years. In 2016 despite increasing its production output by more than 30%, the plant still managed to cut its discharges by more than 25%. A new process water improvement project was also launched during the year to improve discharges even further in 2017.

Reducing wastewater discharges

Adisseo uses resources provided by TK Blue to analyze CO2 emissions per kilometer traveled indexed against the transportation options used to ship products to customers. It also calculates the social costs involved, the performance of transportation partners and the volume of CO2 emitted. The results show that Adisseo succeeded in reducing its carbon footprint by more than 20,000 tonnes of CO2 between 2015 and 2016.

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Adisseo has conducted a life cycle assessment of the two forms of methionine: powder (Rhodimet® NPP9) and liquid (Rhodimet® AT88). The assessment results show that the production of Rhodimet® AT88 has a lower effect on all the main environmental parameters - global warming, acidification and natural resource/non-renewable energy consumption. As a result, the carbon footprint imposed by Rhodimet® AT88 manufacture is around 40% smaller.

Greener deliveries

Adisseo South America has launched a logistics project designed to reduce the environmental footprint of its deliveries. The project is currently implementing a greenhouse gas emissions reduction program covering 87% of all Adisseo road deliveries in Brazil. This initiative has been recognized with the award of an Entrega Ecologica eco-delivery certificate.

Achieving ‘Zero Odor’

The ‘Zero Odor’ project was launched in 2016 with the aim of minimizing the risk of inconveniencing local communities in the vicinity of our production plants. The Nanjing site is the first to benefit from this project, with the mapping of odors and the subsequent identification of 27 sensitive points as potential odor sources. In 2017, the Jiangsu Institute will quantify and characterize the odors as the basis for eliminating them. The same procedure is already underway at our other production sites. With the same goal in mind, the Cinachem laboratory set up a ‘judging panel of noses’ in 2016 as part of integrating this odor issue into the design of Adisseo processes and products.

Understanding the environmental impact of methionine

Adisseo water consumption is closely controlled, despite increased business volumes. A high level of effectiveness is delivered by drinking water consumption reduction initiatives.

Water withdrawal

<table>
<thead>
<tr>
<th>Year</th>
<th>Drinking Water</th>
<th>Process Water (treated water)</th>
<th>Total Water Withdrawal</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>2,227</td>
<td>0.47</td>
<td>2,274</td>
</tr>
<tr>
<td>2015</td>
<td>2,227</td>
<td>0.47</td>
<td>2,274</td>
</tr>
<tr>
<td>2016</td>
<td>2,227</td>
<td>0.47</td>
<td>2,274</td>
</tr>
</tbody>
</table>

Water discharge

<table>
<thead>
<tr>
<th>Year</th>
<th>COD (Chemical Oxygen Demand)</th>
<th>SM (Suspended Matter)</th>
<th>BOD5 (Biological Oxygen Demand)</th>
<th>Total Nitrogen</th>
<th>Total Phosphorus</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>2.5</td>
<td>7.3</td>
<td>1.8</td>
<td>0.76</td>
<td>0.816</td>
</tr>
<tr>
<td>2015</td>
<td>2.3</td>
<td>7.9</td>
<td>2.2</td>
<td>0.81</td>
<td>0.815</td>
</tr>
<tr>
<td>2016</td>
<td>2.2</td>
<td>8.3</td>
<td>2.5</td>
<td>0.78</td>
<td>0.814</td>
</tr>
</tbody>
</table>

Water withdrawal and discharge data are based on the following definitions:

- **Drinking Water** (in 1,000 m³): Volume of water discharged into surface water after treatment.
- **Process Water** (in 1,000 m³): Volume of water discharged directly into surface water.
- **COD**: Chemical Oxygen Demand.
- **SM**: Suspended Matter.
- **BOD5**: Biological Oxygen Demand.
- **Total Nitrogen**.
- **Total Phosphorus**.

Significant progress has been made with the majority of discharged water constituents. In 2016, the main contributions came from performance improvements at the Commentry wastewater treatment plant. Further improvement plans have already been developed to consolidate this trend.

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### OUR COMMITMENT TO THE ENVIRONMENT

**Materials consumption**

<table>
<thead>
<tr>
<th>Year</th>
<th>Direct materials consumed (t)</th>
<th>Non-renewable materials consumed (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>3,420</td>
<td>2,257</td>
</tr>
<tr>
<td>2015</td>
<td>3,605</td>
<td>2,473</td>
</tr>
<tr>
<td>2016</td>
<td>3,595</td>
<td>2,570</td>
</tr>
</tbody>
</table>

The increase in non-hazardous waste relates primarily to the removal of earth required to invest in storage capacity for acids awaiting regeneration; a service offered to our sulfuric acid customers to avoid the need for them to destroy acid after use. Other categories show significant improvement.

**Energy consumption**

<table>
<thead>
<tr>
<th>Year</th>
<th>Direct energy consumption (MWh)</th>
<th>Indirect energy consumption (MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>265</td>
<td>15</td>
</tr>
<tr>
<td>2015</td>
<td>318</td>
<td>16</td>
</tr>
<tr>
<td>2016</td>
<td>344</td>
<td>17</td>
</tr>
</tbody>
</table>

The rise in total direct energy consumption is largely attributable to the ramp-up of our Nanjing (China) plant. Nevertheless, consumption has been contained as a result of improvement initiatives implemented throughout the group.

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**Waste**

<table>
<thead>
<tr>
<th>Year</th>
<th>Incinerated waste (t)</th>
<th>Waste sent in agricultural (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>24.9</td>
<td>24.2</td>
</tr>
<tr>
<td>2015</td>
<td>24.7</td>
<td>24.1</td>
</tr>
<tr>
<td>2016</td>
<td>20.7</td>
<td>20.7</td>
</tr>
</tbody>
</table>

### Using less drinking water

Following an analysis of the many uses made of drinking water at Roches-Roussillon, a great deal of work was done in 2016 to reduce more than half total consumption, thereby saving more than 1500 m³ of drinking water every month.

### Cutting water and energy consumption on all Adisseo sites

The issue of sustainability applies equally to office buildings. All Adisseo headquarters in Antony (France), water-savings systems installed for all washrooms have cut water consumption by 50% during 2016. Energy consumption has also been reduced by optimizing heating control settings and scheduling the use of fan-coil air-conditioning units.

### -1,500 m³ of drinking water are consumed at Roches-Roussillon per year

### -30% of water consumption in Adisseo headquarters in Antony in 1 year