HSE Report
(Health, Safety, Environment)

Extracts from the 2018 reference document

CORPORATE RESPONSIBILITY AND NON-FINANCIAL PERFORMANCE

> **5**

5.1 A CORPORATE RESPONSIBILITY POLICY GEARED TOWARDS SUSTAINABLE ECONOMIC PERFORMANCE

For more than 15 years, Thales has been proactively deploying a strong corporate responsibility policy based on the highest international standards.

This is especially reflected in Thales's commitment to the United Nations Global Compact, which it signed in 2003. Thales upholds the Global Compact's 10 principles relating to Human Rights, labour standards, environmental protection and the fight against corruption. These commitments, implemented on the basis of agreements and best practices guaranteeing that the Group will conduct business responsibly, resulted in Thales achieving the Global Compact's Differentiation Programme "GC Advanced level" in 2012.

The appropriateness of the Group's corporate responsibility policy was also recognised by the Dow Jones Sustainability Index (DJSI). In 2018,

for the second year in a row, Thales was ranked first in the Aerospace & Defence segment in the World version of the Dow Jones Sustainability Index (DJSI). Similarly, non-financial rating agency MSCI awarded Thales a rating of AA for the third consecutive year for its corporate responsibility policy, in an endorsement of the Group's continuing efforts in this area.

Lastly, Thales publishes an integrated annual corporate responsibility report which aims to provide all stakeholders – employees, customers, suppliers, business partners, local communities, public authorities, NGOs, etc. – with details of how the organisation interacts with its ecosystem and uses capital to create this value in the short, medium and long term.

Today this process is monitored at board level by the Strategic and Corporate Social Responsibility Committee.

5.2 RISKS SELECTED FOR THE NON-FINANCIAL PERFORMANCE STATEMENT

When identifying CSR risks for inclusion in the Non-Financial Performance Statement, the Group first narrowed down the list to 15, drawn from a variety of sources:

- the Group's risk mapping;
- the materiality matrix published in the Group's integrated report;
- a list of CSR challenges identified by the Sustainability Accounting Standards Board (SASB), Dow Jones Sustainability Index (DJSI) and non-financial rating agency MSCI as likely to have a material impact on companies in the Aerospace/Defence segment;
- a study of CSR challenges identified by French and foreign companies comparable in terms of size and business segment.

These CSR challenges were assessed by the Group's main support functions[1] which ranked relevant "gross" risks (i.e. before taking into account any remedial measures) in order of importance using impact and likelihood scales.

From that ranking of gross risks, the Group selected six that met the strict definition of Articles L. 225-102-1 III, paragraph 1 and R. 225-105 I 1° of

the French Commercial Code. Said articles suggest considering for the Non-Financial Performance Statement the main risks (including, where relevant and proportionate, the risks created by the Group's business relationships, products or services) pertaining to the way in which the company takes account of the social and environmental consequences of its business activities, to the impact of its business activities on Human Rights and to the fight against corruption and tax evasion.

The six risks selected on that basis relate to:

1. diversity and inclusion;
2. protecting the health and safety of employees;
3. environmental impacts related to the Group's activities;
4. anticipation of environmental standards in product design;
5. compliance with rules of ethical business conduct (particularly the fight against corruption and influence peddling);
6. vigilance regarding suppliers' compliance with corporate responsibility issues.

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(1) Representatives from the Finance, Health, Safety & Environment, Human Resources, Purchasing, Audit, Risks & Internal Control, Strategy & Marketing, Ethics & Corporate Responsibility, and Communications Departments (Thales Foundation), plus the Group Secretary and General Council and corporate management.

These risks are presented in section 3, "Risk factors, risk management and internal control", of the 2018 Registration Document, as reproduced below.

Risk identification	Risk monitoring and management

1. Diversity and inclusion

In a more globalised cultural and technological environment, increasing team diversity and developing a more inclusive corporate culture are key ways to support innovation and creativity thanks to a broader range of approaches, perspectives and ideas.

Lack of diversity could affect the Group's ability to respond to major technological changes, customer expectations and business models, which could in turn have a negative effect on its competitiveness, business activities and profitability.

Since 2016, proactive targets have been introduced Group-wide to strengthen diversity and inclusion in the broad sense of the term. These targets are covered in a quarterly monitoring dashboard (see section 5.4.2).

In an effort to encourage team diversity and employee inclusion and ensure differences are respected, the Group has adopted a dedicated governance system structured around a Steering Committee, a Diversity and Inclusion Council and a central Diversity and Inclusion function.

In terms of gender diversity and professional equality, the Group has been rolling out negotiated action plans in France since 2004 under agreements signed with trade unions.

Since 2009, Thales has been signatory of a European agreement, called IDEA, which includes gender equality commitments.

The Group's initiatives in this area are discussed in greater detail in section 5.4.2.

2. Workplace health and safety

If they were mismanaged, the changes in work patterns, the tightened regulatory provisions relating to the working environment, and the issues around industrial safety would expose Thales to sanctions, resulting in costs and risks to its image.

Lack of a high-quality work environment may also negatively impact teams' motivation.

The Group has set up a special body that aims to prevent workplace health and safety risks in the countries where it is present, in the major entities, at Thales sites and at external sites. This also includes anticipating risks related to substances and products and managing major health crises that might occur internationally.

The Group Human Resources and Health, Safety and Environment departments have introduced tangible measures to prevent risks related to workplace health and safety and improve quality of life and wellbeing at work (see section 5.4.3).

The risks to which employees and outside contractors may be exposed are assessed and monitored on a regular basis throughout the Group. Cross-functional steering committees comprising specialist doctors and/or officers from the HSE network meet several times a year (see section 5.4.3).

3. Environmental impacts related to the Group's activities

Emissions generated by the Group's business activities have the potential to affect the environment, while the use of Group products by customers may contribute to the production of greenhouse gases that contribute to global warming.

However, the Group's exposure to these risks of environmental damage is limited to the extent that its core business is engineering and software development.

That said, should some of its industrial operations fail to comply with environmental laws and regulations, the Group would be exposed to sanctions, damage to its image and potentially, refusal by some customers to do business with Thales.

Furthermore, the risks resulting from climate change (natural disasters, supply chain disruption, market instability, etc.) could have a negative impact on the Group's performance and its business model.

Thales updates its environmental risk analysis on a regular basis in accordance with its business activities, scientific and technical developments and regulatory changes. To support this analysis, which also includes the Group's corporate social responsibility, the Group has introduced an organisational structure and resources at all its sites to control and limit the environmental impacts of its activities (see sections 5.6.2 and 5.6.3).

Total provisions for environmental risks amount to €4.85 million at 31 December 2018.

In 2018, the Group also analysed its main product lines and incorporated an eco-design policy for managing new projects. This is designed to reduce the impact of product use as regards energy efficiency and a low carbon footprint.

Lastly, in recent years Thales has performed regular assessments of its sites' exposure to natural disasters in order to reduce its vulnerability to the effects of climate change (floods, hurricanes, fires, water stress, etc.).

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Risk identification	Risk monitoring and management

4. Anticipation of environmental standards in product design

Changes in environmental regulations may rule out certain technical or technological solutions, particularly for certain suppliers or subcontractors. This may result in the need to qualify and implement alternative solutions. It may also result in changes to the supply chain or the upgrading of industrial resources, with the costs and timescales associated with such changes.

In addition, regulatory differences between countries and constant changes to regulations make it more difficult for Thales to verify the compliance of marketed solutions and could even put the company at a competitive disadvantage.

Lastly, some customers' expectations may exceed regulatory requirements alone and in some cases lead to solutions that are technically impossible or to substantial additional costs.

The Group has promoted a responsible product policy for several years.

It produces an analysis of environmental risks and their impact on the supply chain, on product design and on conditions for accessing various markets that is updated on a regular basis based on new challenges and regulatory changes (e.g. REACh in Europe, use of chemicals, etc.).

These factors relating to regulations or to meeting customer needs are passed on to suppliers and the supply chain through contracts and/or specifications.

Solutions for replacing hazardous substances are being developed ahead of regulatory deadlines.

See section 5.6.4 for more details.

5. Compliance with rules of ethical business conduct (particularly the fight against corruption and influence peddling)

Thales's business encompasses a variety of sectors in more than 50 countries.

Failure to comply with applicable laws and regulations relating to business ethics and, in particular, the fight against corruption and influence peddling, may have serious legal and financial consequences for the Group and severely damage its reputation.

The Group's anti-corruption compliance programme, which has been in place for many years, has been further strengthened to take account of recent legislative and regulatory changes, especially those resulting from France's "Sapin II" law.

The Group's anti-corruption policy is described in section 5.7.1.

6. Vigilance concerning supplier compliance with corporate responsibility issues

Thales's purchases account for around 44% for of its revenues. These purchases are made worldwide from more than 15,000 suppliers and subcontractors of all sizes, many of whom have their own subcontracting chains.

Despite the Group's increased vigilance, it is difficult to guarantee that all stakeholders in the upstream supply chain will be fully compliant with the laws relating to social, environmental and ethical responsibility.

Should any of them fail to comply, the Group's business, image and profitability could be impacted.

Monitoring and management of this risk are included in the Duty of Care Plan (see section 5.7.3.2) pursuant to law No. 2017-399 of 27 March 2017 on the duty of care of parent companies and contracting companies.

The Non-Financial Performance Statement also includes the disclosures required under Article L. 225-102-1, III, paragraph 2 of the French Commercial Code[1].

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(1) These include disclosures about the consequences for climate change of the company's activities and the use of the goods and services it produces, its corporate commitments to sustainable development, the circular economy, the fight against food waste and food insecurity, respect for animal welfare and responsible, fair and sustainable food, collective agreements concluded within the company and their impact on the company's economic performance and employees' working conditions, initiatives aimed at combating discrimination and promoting diversity and measures taken in favour of people with disabilities. See the related summary table in Section 9.

5.3 NON-FINANCIAL PERFORMANCE DASHBOARD

Issue/Risk	Policies	Key performance indicator	Outcomes 2017[a]	Outcomes 2018
1. Diversity and inclusion	Thales's commitment: Bring out the best in everyone *"At Thales, I work in teams that are open to diversity and value our differences and backgrounds."* **Cross-functional initiative taken by the Executive Committee as part of the Group's Ambition 10 strategic vision** Being a global leader with a strong local presence means embracing diversity in all its forms: gender, age, origin and nationality. A truly diverse, global organisation has an additional advantage when it comes to competitiveness and retaining top local talent. Diversity stimulates innovation and creativity thanks to a broad range of approaches, perspectives and ideas. Inclusion, which presupposes the acceptance of diversity and recognition of its importance, will improve Thales's collective performance.	% of women among new hires	30.6%[b]	32%[c]
		% of women in top positions	15.6%[d]	16.5%[e]
		% of Management Committees[f] with at least three female members	33.6%	49%
2. Workplace health and safety	Thales's commitment: Be attentive to everyone *"At Thales, my manager trusts me: he gives me responsibility and looks out for my wellbeing."* *"At Thales, I have all the resources and support I need to maintain a healthy work-life balance."* Thales's commitment: HSE policy *"Thales is committed to providing a safe and healthy working environment for its employees at its own sites and at external sites."*	Absenteeism rate	2.54%	2.4%
		Frequency rate of accidents at work	2.19	2.01
		Percentage of employees working at an OHSAS 18001/ISO 45001-certified site	82%	83%
3. Environmental impacts related to the Group's activities[g]	Thales's commitment: HSE policy *"Thales is committed to safeguarding the environment by limiting impacts (energy, climate, natural resources, etc.) and preventing pollution risks."*	Change in energy consumption (in thousands of toe)	1%	0.5%
		Change in energy intensity (in toe/€m)	−9%	−11%
		Monitoring of CO_2 emissions (scopes 1 & 2): • in million tonnes of CO_2 • in tonnes of CO_2 /€m	 4% −6%	 −5% −16%
		Change in production per person of non-hazardous waste	+11%	+3.5%
		Recycling rate of non-hazardous waste	55%	59%
		Percentage of employees working at ISO 14001-certified sites	89%	89%
4. Anticipation of environmental standards in product design	Thales's commitment: HSE policy *"Thales is committed to designing, purchasing, producing and providing solutions, products and services that meet health, safety and environmental requirements."*	Industrial processes affected by the substitution of chromates	−	In line with plan
		Assessment of the reduction in products' environmental impact	−	1 representative eco-product in each activity segment
		Development of tools for the eco-design awareness programme	−	Materials available

(a) Data provided for comparison purposes, where available, in accordance with Article R. 225-105-1 of the French Commercial Code.
(b) Total hires (permanent, temporary and work-study contracts).
(c) Total hires (permanent, temporary and work-study contracts).
(d) Workers in grade 10, 11 or 12 positions.
(e) Workers in grade 10, 11 or 12 positions.
(f) Management committees of the Global Business Units, Business Lines and Key Countries.
(g) Changes relating to the environmental performance indicators shown below are expressed with reference to 2015.

Issue/Risk	Policies	Key performance indicator	Outcomes 2017[a]	Outcomes 2018
5. Compliance with rules of ethical business conduct (particularly the fight against corruption and influence peddling)	Thales's commitment: zero tolerance for corruption *'Ethical conduct, integrity and compliance with regulations must be the rule for all Group employees throughout the world and at all levels of the company.'*	Number of operational entities that assessed risks of corruption	110	113
		Anti-corruption training[c]	1,035	4,563
		Alerts received via the Group's alert system *Including alerts about acts of corruption*	16 None	15 None
6. Vigilance concerning supplier compliance with corporate responsibility issues	Thales's commitment: Get all its suppliers to adhere to its approach to Corporate Responsibility *'Thales establishes relationships of mutual cooperation with its suppliers, based on mutual loyalty.'*	Supplier performance in domains of corporate responsibility (average score out of a total of 10)	8.3	8.7
	Thales requires all its suppliers to comply with commitments relating to Human Rights, labour law and environmental protection.	Percentage of class A[b] suppliers assessed in terms of their environmental maturity	67%	84%

(a) Data provided for comparison purposes, where available, in accordance with Article R. 225-105-1 of the French Commercial Code.
(b) All suppliers accounting for 80% of purchasing volumes.
(c) The 2018 training campaign focused on e-learning, which was not the case in 2017.

5.4.3 A high-quality, safe and healthy work environment

One of the Group's key priorities is to provide a safe and healthy work environment for all employees, in compliance with applicable law, by monitoring procedures, preventing health and occupational risks and training employees. To this end, Thales is committed to being attentive to everyone's needs, making sure that employees have the trust and support of their managers and benefit from resources that allow them to have a healthy work-life balance.

Thales is committed to a deliberate, responsible approach to prevention and protection for the safety of the Group's employees. This commitment, included in its ethical principles, is reflected most notably in the policy to reduce health and safety impacts and risks in its activities worldwide, in its products and at the various levels of the organisation.

Within the Group, the Human Resources and Health, Safety and Environment Departments share the vast domain of quality of life at work and health and safety (H&S). They define the health and safety strategies, policies and processes and coordinate best practices for deployment in host countries. They also implement practical measures to ensure workplace risk prevention, health and safety.

5.4.3.1 Quality of life and wellbeing in the workplace

Improving quality of life in the workplace is part of a corporate project organised and structured around a shared, ongoing strategy created in conjunction with social partners which contributes to the definition of a safe and healthy working environment. A new Group agreement on quality of life and wellbeing at work within the Thales group in France was signed on 20 April 2018 with the unanimous backing of the trade unions.

5.4.3.1.1 High-quality social dialogue

In all areas of common interest, Thales promotes cooperation with its employees and their representatives, and provides them with high-quality information, in particular by supporting and encouraging employee relations. To allow everyone to develop together in a changing world, the Group encourages and considers ideas put forward by its employees regarding its development and its future. This cooperation helps develop a high-quality working environment.

Appropriate social dialogue bodies

- **European Works Council**

Created by an anticipation agreement, the European Works Council (EWC) comprises representatives from Thales's 13 main European countries.

In 2018, the European Works Council Select committee held two ordinary plenary meetings, two extraordinary plenary meetings and three meetings (including one in Rome). In addition, two information and discussion meetings took place as part of the work of the European Works Council within each of the Group's business domains to discuss the strategic and social perspectives of these businesses with staff representatives.

- **Trade union coordination body at the corporate level in France**

The Group has set up a body to coordinate representative trade unions at Group level in France. In addition to acting as the interface between the Group and the trade unions present in each of its companies, this body is responsible for addressing all negotiations with Group-wide impact and ensuring agreements are rolled out within the relevant companies.

- **Thales Works Council in France**

The Thales group Works Council was created in 2000 as the result of an agreement whose provisions were revisited in conjunction with all the trade unions in 2011. The 30-member Group Works Council is a body for information, deliberation and discussion aimed at developing dialogue between corporate management and employee representatives on the position and strategic focuses of the Group's main areas of business. It is also consulted annually on Thales group-level strategic focuses. The Group Works Council met three times in plenary sessions in 2018.

Collective bargaining

- **Collective bargaining around the world**

At the end of 2018, a total of 86.1% of Thales group employees worldwide were covered by collective agreements, including the European agreements signed by the Group. The companies in question can add locally negotiated agreements to this common framework. Nearly 50 new collective agreements were signed in France in 2018, showing the importance and dynamism of social dialogue.

In 2009, Thales also wanted to step up social dialogue at the European level and to this end signed its first European agreement with the European Metalworkers' Federation (EMF, now IndustriAll European Trade Union) on Improving professional Development through Effective Anticipation (IDEA). The IDEA[1] agreement affects more than 50,000 employees and defines very specific objectives for improving employees' professional development, through some 20 or so programmes.

The momentum created at European level by the IDEA agreement led to the signing, in April 2010, of a second European agreement with the EMF on the Transparent annual Activity discussion for mutual Listening and developing professional Knowledge[2] (TALK).

- **Collective bargaining in France**

In France, numerous Group agreements have been signed since 2006, forming a basis that is common to all employees, whichever company they work for.

The Group began a new round of negotiations in 2018 in the firm belief that collective bargaining aimed at improving working conditions for employees and sharing strategic information with employee representatives is a major contributor to its economic performance. In 2018, six new structural agreements were signed at Group level in connection with this social dialogue:

- the Group framework agreement on telecommuting, signed on 23 March 2018;

- the Group agreement on resources for the Thales group "intercentres" (trade union bodies that liaise with management), signed on 23 March 2018;

- the Group agreement on quality of life and wellbeing at work within the Thales group, signed on 20 April 2018;

- the Group agreement on elected employee representation and local representatives, signed on 13 December 2018;

- the Group agreement on workplace dialogue, trade union rights and career development of employee representatives, signed on 13 December 2018;

- amendment No. 13 on the social provisions applicable to employees of Thales group companies, signed on 13 December 2018, relating to the reduction of pension plan contributions applicable to Group employees about to retire.

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(1) Improving professional development with more effective anticipation.
(2) Agreement on the Annual Activity Discussion.

In addition to carrying out compulsory annual negotiations, the Group's French subsidiaries also signed several agreements in 2018. The main topics of the negotiations were gender equality, the introduction of telecommuting, and harmonisation agreements related to the simplification of the company's legal structures in France as from 31 December 2017.

5.4.3.1.2 Tangible measures to improve quality of life and wellbeing in the workplace

Thales has implemented a number of ambitious, innovative agreements to promote quality of life in the workplace. For example, on 20 April 2018 it signed the Group's third agreement on quality of life and wellbeing in the workplace, which defines a general framework for Thales's health and safety policy and introduces a collective prevention process to identify, assess and deal with situations that may present occupational risks. The agreement is aimed at preventing the appearance of psychosocial risks (PSR) by paying particular attention to primary prevention, with measures to prevent their appearance being documented in a unique risk assessment document for each establishment.

To raise employee awareness of the importance of factoring quality of life at work into their daily work activities, every year Thales companies/establishments in France organise a "quality of life at work" week, during which employees can attend a large number of workshops and talks.

Thales has also introduced a participative process whereby employees are given the opportunity to express themselves through expression groups, the aim being to encourage and promote employee dialogue. The purpose of this direct, collective expression is to define the measures needed to improve quality of life at work, especially working patterns, working conditions and work quality.

Tangible measures have also been taken to make it easier for employees to reconcile professional and personal obligations, including the creation of inter-company crèches and concierge services. The company's approach also includes good use of online tools and the right to disconnect. Training and awareness campaigns are being implemented.

In 2018, 285 employees in management positions attended training on psychosocial risk prevention. Of these, 102 were trained using a new version of the training called "The manager: a key player in the quality of life at work", provided by the Thales Learning Hub, which incorporates elements of the Thales quality of life at work Agreement signed in 2018.

The Group framework agreement of 23 March 2018 on teleworking, which has since been supplemented by company agreements, is fully in line with this commitment to improve quality of life at work.

Lastly, a central "quality of life at work" committee supports all of these initiatives.

Solid welfare cover

Offering employees quality health and death/disability coverage helps to support them throughout their working lives. Some countries have brought in specific measures in this regard. In France, employees have had a harmonised collective status across all companies and identical welfare cover, whatever the legal entity concerned, since 2006.

This cover was adapted by the agreement of 12 December 2016 to take account of regulatory changes and then amended on 23 February 2017 when new solidarity and social cohesion measures were introduced. These included the supplemental daily parental attendance allowance, the allocation of rest days and the widespread application of employer contributions for eligible forms of employee leave.

Working time

For the Group, the organisation of working time should allow a balance between work and personal life, with each country adapting working time according to the applicable legislation, regulations and agreements.

A total of 93.1% of Group employees are full-time; part-time contracts generally reflect a choice by the employee.

The set of measures implemented by the Group to improve quality of life and wellbeing at work help to maintain a relatively low rate of absenteeism.

> **Performance related to workplace health and safety (NFPS):**
>
> Overall absenteeism rate at the company: **2.4%**

In France, the total rate of absenteeism calculated in accordance with the social report was 3.37% in 2018. This rate has remained relatively unchanged for the last few years (3.25% in 2017, 3.27% in 2016). The absenteeism rate, excluding parental leave, also remained unchanged at 2.69%. The proportion of absenteeism relating to accidents at work, commuting accidents and occupational illnesses was similar to the proportion recorded in the previous year and remained consistently low.

5.4.3.2 Preventing workplace health and safety risks

5.4.3.2.1 Policy and corporate governance

Risk policy and analysis

Since March 2016, Thales has reaffirmed its commitments to risk prevention and employee protection through one of the three fundamental priorities of its latest Health, Safety and Environment policy. These commitments have featured among the Group's ethical principles for over 15 years.

This deliberate, responsible approach to preventing risks and protecting employee health and safety is coordinated by the Group's Health, Safety and Environment (HSE) Department and implemented in all host countries and GBUs through a series of workplace health and safety measures covering culture, risk prevention and skills reinforcement.

Independently of ensuring compliance with applicable regulations and anticipating future regulatory changes, this deliberate policy has two key areas of focus in terms of health and safety:

- provide a safe and healthy working environment for its employees at its own premises and at external sites;
- design, purchase, produce and provide solutions, products and services which meet health, safety and environmental requirements.

As part of the implementation of this policy, Thales produces risk analyses at all its sites and updates them on a regular basis according to its business activities, scientific and technical developments and emerging challenges. These analyses are produced to:

- check the conformity of business activities and products used or placed on the market;
- ensure that employees are not exposed to specific risks but if so, that they know how to control them;
- monitor that business activities are not likely to affect the environment through technological accidents;
- analyse and anticipate the impact of new regulations.

Risk assessments and analyses of legal requirements and compliance obligations are formally documented by HSE experts at all Group sites, as well as at external sites.

A dedicated HSE structure

In order to keep improving its performance in terms of health, safety and risk prevention, Thales has created a global network of HSE managers divided into three categories: "sites/operations", "external sites" and "product engineering". The network covers all countries, GBUs and Thales entities and deploys preventive measures at work sites (employee exposure and protection, implementation of appropriate avoidance and protection measures, etc.), for operations (industrial processes, substances, external sites, etc.), and for products placed on the market (product design, substances used).

The network is coordinated by cross-functional global HSE Steering Committees which roll out prevention standards that prioritise general prevention principles (elimination/substitution of hazards, appropriate instructions for workers, and control methods) and best practice.

The Committees meet three times a year while the community of members of the global HSE network meets once a year to set, consolidate and share the Group's HSE policy. The other departments are also involved in these issues.

The HSE Department was also invited to participate in the company's Doctors Coordination Committee in France in 2018.

5.4.3.2.2 Tangible measures

Maintaining skills and risk awareness

Knowledge of the risks and how to prevent them is crucial to maintaining the skills of managers and employees. These are the people who also need to be aware of the risks and how to manage them and the appropriate behaviours to be adopted. Thales's HR and HSE functions run and maintain training courses in workplace safety and security throughout the Group. These are based on specific needs identified at individual premises or job sites and offered at the local level, or on programmes defined at the corporate level and rolled out across all entities.

To underpin knowledge and skills relating to health and safety, dedicated training modules are delivered throughout the Group by in-house trainers, HSE managers or specialist independent bodies. E-learning modules are also available to all employees through the Thales Learning Hub. These training courses are aimed not only at those responsible for health, safety and the environment but also the relevant job families (purchasing, design, operations, etc.) and all Group employees.

The courses cover general workplace safety training (induction and on-the-job training, fire safety, first aid, etc.), specific training in risks encountered (electrical, chemical, radiation, ergonomic, psychosocial risks, etc.), tools training (risk analysis, regulatory monitoring, standards, audit and inspection techniques), and training in management and best safety practices. As an example, in 2018 more than 85,000 safety training hours were provided in France and the United Kingdom (not including training lasting less than a day).

Programmes on awareness and communication, defined and disseminated locally by HSE managers based on a site's specific needs or at the country or corporate level, are another way of making sure all employees are aware of potential risks and how to deal with them. For instance, the Group publishes a quarterly HSE newsletter and conducts an annual awareness campaign focusing either on a specific or more general risk. (Since 2015, information has been provided about best practices in the presence of risks related to tripping, material handling or driving.)

Lastly, a dedicated HSE portal is available to all employees on the Group intranet.

Operational control

The Group's operational departments, with the support of HSE specialists, ensure that facilities meet safety standards at all times, that collective and individual means of protection are available, that employees and external partners are familiar with instructions and procedures, which includes organising emergency drills, and that safety aspects are factored into local management. For example, the LEAN culture continues to be rolled out throughout the Group, with workstation cleanliness and safety a central feature, while HSE considerations are incorporated into operational practices through team presentations, workshop visits and improvement initiatives. At the same time, the Group's HSE experts ensure that HSE standards are applied consistently at premises and work sites and that teams get the support they need to manage workplace health and safety at the local level, based on the OHSAS 18001 management standard (currently transitioning to ISO 45001). As at 31 December 2018, the Group held 103 OHSAS 18001/ISO 45001 certificates representing 83% of the global workforce.

> **Performance related to workplace health and safety (NFPS):**
>
> Number of employees working at site certified OHSAS 18001/ISO 45001 in 2018: **83%**

> **CHANGE IN THE NUMBER OF EMPLOYEES WORKING AT OHSAS 18001 SITES**

Year	
2014	72%
2015	76%
2016	81%
2017	82%
2018	83%

Employee performance reviews and continuous improvement

Certified sites carry out internal audits so they can share best practices on an ongoing basis and improve their HSE practices. They also arrange for monitoring audits by external bodies to ensure independent oversight of their HSE management at the sites. The Group has strengthened these processes by setting up a system to assess HSE maturity. The system has been in place in all entities since the end of 2017 to strengthen the Group's safety culture and the commitment of managers and employees and help improve the performance of the Group and its partners. The Group Health, Safety and Environment team relies on a team of 23 qualified auditors to perform HSE maturity assessments. So far, 23% of the highest-risk sites around the world have been audited.

Meanwhile, the performance of Group employees in terms of the number of workplace accidents, the achievement of accident reduction, accident severity and technological risk prevention targets has been monitored on a quarterly basis since 2018 by the Country Management Committees and the Group Operations and Operational Performance Committee.

> ### CHANGE IN FREQUENCY RATE
> ### (WORKING DAYS LOST DUE TO ACCIDENTS AT WORK)

Year	Rate
2014	2.34
2015	2.33
2016	2.14
2017	2.19
2018	2.01

> ### CHANGE
> ### IN SEVERITY RATE

Year	Rate
2014	0.077
2015	0.062
2016	0.049
2017	0.055
2018	0.048

With regard to accidents at work, the overall frequency rate stood at 2.01 for 2018, a net improvement and relative decrease since 2012. The rates differ substantially for each country, depending in particular on the activities taking place there.

> ### Performance related to workplace health and safety (NFPS):
>
> Frequency rate of accidents
> at work worldwide: **2.01** in 2018

The severity rate of accidents at work was 0.048 in 2018, which was a net improvement (corresponding to 5,245 days lost in 2018). Added to this figure is an equivalent number of days lost due to commuting accidents (4,415 days lost). The rates differ substantially for each country, depending in particular on the activities taking place there.

It should be noted that the inherent difficulty of defining the concept of occupational illness in the countries means it has not been possible to consolidate this information across all countries in which the Group is established. The information on occupational illness is consequently shown only for France. In France, 354 working days were lost due to occupational illness in 2018.

Performance is managed by monitoring recently renewed targets set by the Group's HSE Department for all entities:

Safety and security goals	2023 target
Maturity Assessment of the operational maturity of industrial sites	100%
Workplace accidents Reduction in lost-time accidents (FR[a] for Thales employees)	−30%

(a) Frequency rate of accidents at work with subsequent work stoppage.

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5.5 A COMMITTED APPROACH TO MEET ENVIRONMENTAL CHALLENGES

5.5.1 General policy on environmental issues

5.5.1.1 Long-standing commitments renewed and strengthened

Thales is committed to a deliberate, responsible approach to protection of the environment. This commitment, written into the Code of Ethics, has been a driver for the Group for over 15 years and is reflected in a policy to reduce environmental impacts and risks in its various activities worldwide, in its products and at all levels of the organisation. In addition to ensuring compliance with applicable regulations and anticipating future regulatory changes, the policy has four key areas of focus:

- preventing impacts on people and the environment from the Group's activities:
    - by reducing and controlling environmental risks and impacts on health,
    - by consuming fewer natural and energy resources,
    - by respecting biodiversity and cultural heritage;

- factoring the environment into product policies and services:
    - by limiting their environmental footprint whenever possible,
    - by developing solutions that are beneficial for the environment,
    - by using the environment as a driver for innovation;

- significantly reducing our own carbon footprint, as well as that of our clients and civil society:
    - by reducing emissions from our own operations,
    - by promoting low-carbon solutions;

- fostering a spirit of innovation with regard to the environment:
    - by sharing expertise,
    - by communicating transparently,
    - by encouraging the involvement of employees, suppliers and other stakeholders.

To reinforce its commitment, the Group has set performance targets for all of its entities since 2007. Five years ago, these were extended to purchasers, and to staff involved in product policy and in engineering, industry and projects. Current targets have been set for the period 2015-2018 to meet the Group's environmental challenges. The Group is also organised to manage the anticipated gradual replacement of hazardous substances banned for use which could result in obsolescence of our products.

Performance related to environmental impacts in connection with the Group's activities and anticipation of environmental standards in product design (NFPS):

> ### GOALS FOR 2016-2018

	Target	2016-2018 results	2017	2018
Natural resources				
Energy consumption (thousand toe)	−3%	+0.5%	155.6	154.3
Energy intensity (toe/€k)		−11.2%	10.2	9.98
CO_2 emissions				
Energy and substances (scopes 1 and 2) (thousand tonnes of CO_2/€m)	−5%	−16%	14.54	13.79
Non-hazardous waste				
Quantity per person (kg/person)	−5%	+3.5%	179.5	166.8
Recycling rates (%)	>60%	+2.7%	56	58

> ### 2018 GOALS

Eco-design

Industrial processes affected by the substitution of chromates	Adherence to implementation schedule	Compliant
Assessment of the reduction in products' environmental impact	One representative eco-product from each activity segment	Compliant
Development of tools for the eco-design awareness programme	Supporting materials available	Compliant

Detailed values are given in the table in section 5.5.5, "Other environmental indicators".

Lastly, in keeping with past initiatives, particularly those carried out during the COP21 events in 2015, Thales reaffirmed its commitments and determination to combat climate change by signing the French Business Climate Pledge[1] on 11 December 2017.

These commitments were followed in 2018 by the establishment of several working groups with the ultimate aim of improving knowledge, reducing the indirect environmental impact of the Group's activities (Scopes 1, 2 and 3) and setting direct and indirect CO_2 emission reduction targets in line with the 2°C trajectory of the Paris Agreement that will be published in 2019.

These targets are fully in line with the multi-year targets set for the upcoming period from 2019 to 2023 that have been finalised in agreement with internal stakeholders and have their own specific action plans.

> ### GOALS FOR 2019-2023

	2019 target[a]
Natural resources	
Energy intensity (CO_2eq/hour worked)	−3%

	2023 target
Eco-design	
New developments incorporating eco-design	100%
Percentage of Product Line Architects and Product Line Managers trained in or made aware of eco-design	75%

(a) Transition year; the targets for combating and adapting to climate change will be updated in 2019 for the period 2020-2025.

(1) French Business Climate Pledge: on the eve of the One Planet Summit on 12 December 2017, 91 French companies of all sizes and from all sectors announced the signature of a shared commitment to climate. Each of these companies put forward its actions as a committed player in the fight against global warming.

5.5.1.2 Commitment from employees

5.5.1.2.1 Global organisation

Aiming to consistently improve its environmental performance and prevent risks, the Group has set up an organisation that reflects its challenges. This Group Health Safety Environment (HSE) Department is responsible for setting out strategy, policy, processes, methods and associated standards, and for supervising and monitoring their implementation across the Group as a whole, with global facilitation of:

- a network of "Site/Operations Environment" managers at country and entity level, responsible for the environmental aspects of sites (buildings, infrastructure, energy, etc.) and the operations performed (industrial processes, substances, waste, external sites, etc.), bolstered by a real estate management network;

- a dedicated network of "Products and Services Environment" managers in the Group Business Units and Business Lines in charge of integrating environmental aspects in advance of and during offer and product development phases, supported by contacts in the cross-functional services (engineering, industry, purchasing, services, offers, projects, etc.). Its purpose is also to facilitate action to anticipate and research appropriate alternative solutions to hazardous substances that are not recommended or are prohibited.

Operational management relies on these networks, which are coordinated within dedicated job families, to increase momentum and boost skills, determine recruitment and training needs, anticipate future developments and challenges and share them within the same community.

5.5.1.2.2 Employee training and information

E-learning modules are available to educate Group employees on the basic aspects of environmental risk control, general themes such as eco-responsibility or specific issues such as managing chemicals, labelling hazardous chemicals or issues related to climate change. To further support environmental knowledge within the Group, the various job families (environment, purchasing, design, sales, etc.) are offered additional training modules through the Thales Learning Hub.

The Group's HSE Department also participates in conferences organised by other business groups to present its HSE strategy, discuss HSE challenges and describe individual roles when it comes to HSE: DGDI operations, LEAN, manufacturing, real estate, Thales Learning Hub trainers, auditors, purchasing departments, customers, business leader seminars, etc.

Thales offers a variety of communication tools and forums for all employees, including an intranet, displays, events, newsletters and surveys.

5.5.1.2.3 Relations with stakeholders

Thales is committed to communicating in a totally transparent way with local authorities, as well as with its local neighbours and civil society, sharing its challenges with them. Procedures are also in place to receive, deal with and communicate reports and requests swiftly. It is also possible to send questions to the Group's HSE Department using a dedicated e-mail address.

To meet the requirements of civil society, investors, rating agencies and clients, Thales provides its environmental data on its website and also participates in reporting for the Carbon Disclosure Project[1], the Dow Jones Sustainability Index[2] and the MSCI.

In the course of its partnerships, particularly with schools, Thales promotes preservation of the environment through programmes on climate change and natural resources, or by working with universities.

5.5.2 A moderate and controlled environmental footprint of business activities

5.5.2.1 Continuous improvement and prevention process

Thales has integrated the control of environmental impacts and risks in its Group management system, which is available to all employees and in all entities worldwide.

The Environmental Management System has been implemented at all sites as part of a dedicated process for ensuring the control and limitation of environmental risks and impacts of operational activities (buildings, industrial base, equipment and sites), the supply chain (purchases, supplier audits) and products delivered (product policy, design, bids, projects and services).

Integrated into the different processes governing the Group's activities, it defines good practices and methodological guides, as well as specifying the rules to be followed at all levels of the organisation. It also defines the risk management and alert procedures in the event of an accident.

Performance related to environmental impacts in connection with the Group's activities and anticipation of environmental standards in product design (NFPS):

Employees working at
ISO 14001 sites in 2018: **89%**

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(1) Carbon Disclosure Project: an international non-profit organisation that enables companies, cities, states and regions to measure and manage their environmental impacts, and investors and policy-makers to make more informed decisions by explaining to them the consequences of climate change.

(2) DJSI: the Dow Jones Sustainability Index lists the top-performing companies each year according to economic, environmental and social criteria.

> **EMPLOYEES WORKING AT ISO 14001 SITES**

Year	%
2010	75%
2012	80%
2014	88%
2016	89%
2018	**89%**
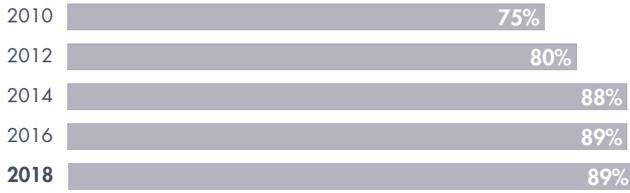
At the end of 2018, 118 sites across the entire Group were ISO 14001-certified, representing 89% of the workforce. The standard includes management of a product's environmental impact. Audit planning takes place on an annual basis. Audits are conducted by the internal audit teams (audit policy, maturity assessment) as well as by external auditors for ISO 14001 certification or prevention visits.

In addition, to provide support to the sites, the eHSE risk management software suite was adapted to changes in standards, particularly in relation to taking into account challenges of stakeholder demands, risks and opportunities within environmental analysis and the effectiveness of actions and associated resources.

5.5.2.2 Environmental risk mapping

The risk of environmental impact related to the Group's activities and that product design may not keep up with environmental standards (see section 5.2, Risks Selected for the Non-Financial Performance Statement) is among the risk factors that may impact the Group's financial position. For many years, Thales has conducted regular analyses and updates of environmental risks to keep pace with changes in its business activities, scientific and technical developments and emerging challenges and opportunities.

This analysis, incorporated into a risk mapping, is intended to:

● ensure that activities and products are compliant;

● ensure that employees and local residents are not exposed to health and environmental risks;

● check that activities do not present a threat to the environment;

● analyse and anticipate the impact of new regulations, including on product design.

Risk mapping consolidates an overview of areas for improvement, which are addressed via action plans either at Group level or locally. Since 2007, the Group's Risk Assessment Committee has overseen an annual evaluation of the risk management system by each of the Group's operational entities, leading if necessary to the development of an improvement plan in collaboration with Group experts.

To enhance its analysis of the risk of damage to Group sites, Thales pursues an active prevention-engineering policy with the support of external partners. The aim is to identify accidental strategic risks that could trigger a major loss and severely disrupt the supply chain, such as fire, industrial incidents, natural disasters, environmental damage, machinery breakdown and water damage. The prevention visits conducted on 160 sites lead to recommendations aimed at reducing the probability of incidents and preventing their consequences.

The risks of material damage related to natural disasters and water stress (risks associated with climate change) are also analysed (see section 5.5.3.4).

Management of environmental risks also encompasses disposals or acquisitions of assets, in respect of which it is important to limit the type, value and duration of any guarantees provided or risks acquired.

Materiality of impacts	Industrial type activities	Tertiary type activities	Comments
Greenhouse gas emissions (Scopes 1, 2 and 3)	Moderate	Moderate	
Soil pollution	Moderate	Insignificant	
Energy consumption	Low	Insignificant	
Production of non-hazardous waste	Low	Insignificant	
Production of hazardous waste	Moderate	Insignificant	
Water consumption	Low	Insignificant	
Emissions in water	Low	None	Tertiary sites discharge their sanitary waste water into local authority networks like any other municipal resident. Industrial sites collect and process their waste water before discharge.
Atmospheric emissions	Insignificant	None	

5.5.2.3 Limited emissions

5.5.2.3.1 Industrial wastewater discharge

Thales's activities generate little in the way of industrial wastewater: 91% of wastewater is discharged from six sites, and 68% from the Mulwala, Australia site alone. Consolidated wastewater discharges have fallen by 12% compared with 2012, as a result of ongoing plant optimisation and modernisation measures and wastewater recycling and reuse.

5.5.2.3.2 Industrial atmospheric discharges

In general, Thales's activities do not generate atmospheric discharges, except for a few specific industrial sites or those linked to site operation (in particular heating).

A few sites discharge industrial atmospheric emissions which are channelled and treated where necessary (with filters, scrubbers, etc.) and regularly checked. This primarily relates to solvents.

The quantities of solvents used are limited. A total of 69 (out of 151) entities purchase solvents, with six of those entities accounting for 89% of purchases. The Mulwala site alone accounts for 75% of purchases and 76% of discharges resulting from the manufacture of propellants requiring a large quantity of solvents. It should be noted that several sites have stopped using solvents or replaced them with detergents.

5.5.2.3.3 Combating noise and odour pollution

While Thales's activities generate very little noise or odour pollution, measures are still put in place to limit them.

Cooling systems are the most common sources of noise pollution, and precautions are taken to limit noise levels associated with this equipment. Sound levels are checked periodically. The few sites where noise is a particular issue are equipped with acoustic attenuation systems, or only conduct noise-generating activities within specific time periods. The increasing use of computer simulations for pyrotechnic testing, for example, also helps to reduce noise.

Thales's activities do not generally generate odour, except for one entity where systems to capture atmospheric emissions have been installed and are regularly checked.

5.5.2.4 Rational resource management

5.5.2.4.1 Preserving water

Water is a vital resource to be protected. Accordingly, since 2000, Thales has been engaged in a far-reaching programme to reduce its consumption by, among other things, dealing with leaks, centralising the management of its networks, replacing water-intensive equipment, optimising industrial processes and recycling water for reuse in industrial processes.

	2012-2015	2015-2018
Water consumption (m³)	−11%	−5%

The Group's overall consumption is down 13% since 2012, confirming the collective efforts made by all sites (including the Mulwala site which alone accounts for 38% of the Group's water consumption). These achievements are due to increased employee awareness and to making best and widespread use of best practices.

5.5.2.4.2 Moderating the consumption of raw materials

Thales designs, develops and supplies equipment, systems and services in aeronautics, space, transport, security and defence. The raw materials consumed by Thales are natural resources and various materials used in the manufacture of products by Thales and its subcontractors.

The search for new technologies and the design of new equipment involve restricting the use of materials to cut down on size and mass and to facilitate dismantling (see section 5.5.4), as well as replacing the substances that are most toxic for health and the environment. These requirements are conveyed to suppliers of the equipment and components that Thales assembles at its sites. The manufacturing processes are also optimised to limit loss of materials and amounts of discharge and waste.

The process of additive manufacturing (also called 3D printing), for example, has been used by Thales to manufacture parts for the space sector since 2017. Boasting a low consumption of raw materials, this new technology also makes it easier to repair parts and optimises service offerings.

Thales has also reduced the use of materials such as wood, cardboard and plastic by limiting and reusing packaging either for procurement on Thales sites or for the transfer of equipment from one site to another, and fully integrates the eco-design concept into the development of its new products to reduce the environmental footprint of Thales and the customers who use its products in all areas where it is technically and economically viable.

5.5.2.4.3 Reducing and managing waste production

Since 2012, Thales's "responsible waste management commitments" have sought to reduce the quantity of waste the company produces and to limit the amount of waste sent to landfill and optimise recycling. These commitments led to a 25% decrease in total waste production per revenues between 2012 and 2018, and a 20% reduction in non-hazardous waste production between 2017 and 2018.

> **CHANGE IN WASTE PRODUCTION**

2012	3,083	177.4	12,573
2015	4,042	161.2	11,003
2018	3,179	166.8	12,099

■ Production of non-hazardous waste (excluding exceptional waste) (tonnes)
■ Production of hazardous waste (excluding exceptional waste) (tonnes)
●— Ratio of non-hazardous waste per person (excluding exceptional waste) (kg/pers.*)
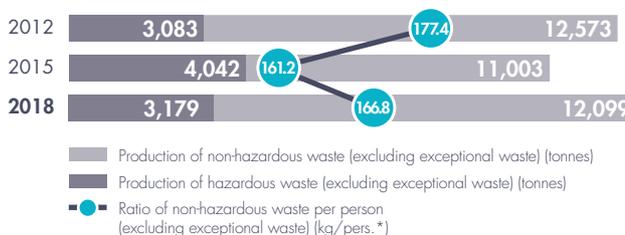
* Based on the average annual number of employees on site, including permanent employees, temporary employees, trainees and service providers permanently on site, and excluding employees on permanent assignment or based at external sites.

As a result of measures taken since 2007, 84% of all waste (excluding exceptional waste) was recovered and 59% was recycled in 2018.

To achieve this, various measures related to selective waste sorting, the search for recycling channels or optimum treatment channels and campaigns to change habits and behaviour (printing policy and reusing cardboard and other packaging, for example) have been introduced. These measures are aimed at reducing waste production and improving waste treatment.

For instance, the amount of waste paper and packaging fell by 27% and 7.3% respectively compared to 2012, with the Group increasingly adopting a digitisation policy.

Certain Group sites reuse packaging either for procurement on Thales sites or to transfer equipment from one site to another.

Hazardous waste has also been a specific target. Dedicated areas for collection and storage have helped to manage this type of waste prior to disposal. The quantity of such waste has decreased consistently since 2015.

5.5.2.4.4   Food waste

Food services companies manage the corporate restaurants at the majority of Thales sites. It is therefore their responsibility to communicate about eating habits and food waste management and they are strongly encouraged to reduce food waste.

5.5.2.5   Protecting the impact on the biosphere and controlling technological risks

5.5.2.5.1   Land use and pollution prevention

Since 1998, the Group has been involved in a programme to assess the risks of pollution and soil erosion. The programme is updated as the current situation warrants. Few sites have shown significant signs of contamination, and where contamination has been identified, it is usually due to earlier industrial activities (some of which are independent of Thales and related to past acquisitions).

When available techniques allow, steps are taken to remove pollution. The impact on the available environmental resources is then reduced to a minimum by preferring in situ treatment to transferring pollution to another site.

The water table is periodically monitored at industrial sites and sites located in industrial areas. The cases in question are monitored in a coordinated manner by the Group's HSE Department in conjunction with the Legal Department.

The Group considers environmental criteria when choosing locations for its sites, looking at climate and geological risks, the impact of its activities on the human and natural environment, and land use. The objective is to optimise compatibility between the Group's activities and the environment. Some activities, such as pyrotechnics, require a specific site due to the risks they generate and need to be bounded by extensive security areas and suitable geology. These areas account for approximately 80% of areas occupied by the Group (two sites in Australia and one in France). However, steps are taken to enhance their ecological value either by promoting biodiversity or by converting them into pasture or farm land. Due to their activity, the majority of other Group sites tend to be in industrial areas (53% of land area excluding pyrotechnics sites).

5.5.2.5.2   Technological risk management

Only one Group site in Europe is a Seveso upper-tier establishment, while two sites in Australia are classified as high industrial risk. In addition to the preventive measures mentioned above and in section 5.4.3.2, a safety management system (including measures such as a major accident prevention policy, a contingency plan, and a risk assessment and the associated management scenarios) is deployed and inspected regularly by the Environment Directorate (the regulatory authority) as part of the Seveso classification process.

The insurance and compensation policies for victims of accidents, including technological accidents for which the Group may be liable, cover all sites insured by the Group including upper tier Seveso sites. Risks arising from accidents (such as fire or pollution) are managed locally, with the support of the relevant Corporate departments if necessary. Accident prevention and management procedures, as well as procedures for handling specific complaints, are in place for such cases. An accident reporting tool makes it possible to analyse accidents that do occur and draw suitable lessons from them. In 2018, five accidents occurred but had no significant impact on health and the environment as corrective measures were immediately taken.

5.5.2.5.3   Protecting biodiversity

The preservation of species, their habitat and ecosystems, the preferential use of areas dedicated to flora and the protection of historical and natural heritage are taken into account in all decisions with a view to contributing to environmental protection. As early as 2006, Thales drew up a preliminary inventory of its sites in France near or within protected areas for flora and fauna and their habitat and, on certain sites, assessed the impact of activities on biodiversity and the degree of dependence on the ecological services provided by nature. It then consolidated this information into a mapping of biodiversity-related risks for Group sites located in the most vulnerable areas. The indicators defined are used to analyse the risks for any project and integrate constraints for future developments. Although the overall impact of the Group's activities on biodiversity is low, the Group encourages its sites and employees to continue to promote action to protect biodiversity. Inventories are carried out at some sites by volunteers or in partnership with local authorities or biodiversity protection agencies, and *ad hoc* management measures are put in place.

Several Australian sites have put in place a habitat management plan which partly involves enclosing several natural habitat areas to control access to herds. This helps to re-establish the natural biodiversity and restore the region's original characteristics. Some species of flowers and animals have been registered on the site as well as some protected habitats such as that of the flying squirrel.

Other sites will focus on outdoor features to preserve the natural habitat and protect fauna (with bird boxes, bee hives, feeders, species survey by an expert, etc.) or to re-establish native species, thereby guaranteeing a balance of habitats in terms of biodiversity, and offering a relatively safe and protected habitat for a wide variety of plants, fungi and animals.

For sites with large areas of plains or forests, particular precautions are taken for fauna and flora by promoting environmentally gentle natural techniques for mowing and grazing and by eliminating crop protection products. Other sites raise employee awareness through photography exhibitions on forests, agroforestry and the species that can be found on site.

5.5.2.6   Guarantees, provisions and compensation

Thales was not cited in any environmental dispute that gave rise to compensation in 2018, and only granted one generic guarantee in relation to the environment. In addition, seven sites were the subject of a letter, request or environmental complaint (within the meaning of ISO 14001) from local authorities, employees or third parties. These have either been or are being dealt with. At 31 December 2018, the amount of reserves for environmental contingencies at Group level was €4.85 million.

5

5.5.3 Meeting the challenges of climate change

5.5.3.1 Climate commitment

Climate change is a major challenge which Thales wishes to address in a consistent manner through its activities and services by reducing its CO_2 emissions at source, as well as by contributing to a better understanding of climate impacts and a reduction in its customers' emissions and those of civil society, thanks to its innovative solutions or through the design of eco-responsible solutions.

To measure its greenhouse gas emissions, over 10 years ago Thales developed a methodology that is consistent with its operations and is based on the Greenhouse Gas Protocol created by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD).

For instance, to affirm its involvement in combating climate change, in 2015 Thales signed the Business Proposals for COP21[1] and presented its innovative solutions for combating climate change at the *Galerie des Solutions* exhibit at COP21 in Paris. In 2016 it exhibited at COP22 in Marrakech, and on 11 December 2017 it signed the French Business Climate Pledge[2], again confirming its determination and commitment to this issue.

In 2018, the Thales group further honoured its commitment by setting up new multidisciplinary working groups to define a new carbon strategy and set targets for reducing its CO_2 emissions in line with the 2°C trajectory of the Paris Agreement. The working groups' key aims are to improve the flow of information regarding CO_2 emissions, determine ambitious but achievable reduction targets, establish a road map and action plan to achieve those targets, support sustainable growth and quantify the amount of CO_2 emissions avoided.

The four main line items responsible for most of the Group's CO_2 emissions have thus been assessed (see sections 5.5.3.2 and 5.5.3.3) and work has begun to consolidate them for scopes 1, 2 and 3 (use of products and services sold, purchasing and logistics, energy performance of industrial operations, commuting and business travel). The groups will continue their work in 2019.

Since 2010, Thales has also been fully transparent about its climate strategy through the Carbon Disclosure Project. In 2018, Thales's rating for its "climate change" performance remained A-, confirming its position as one of the best-performing companies listed.

5.5.3.2 Reducing emissions related to energy efficiency and chemicals

In recent years, Thales has implemented initiatives to reduce its energy consumption and use of chemicals which will in turn reduce greenhouse gas emissions related to its activities.

In view of the energy stakes, Thales sets targets for reducing energy consumption, resulting, for example, in very little increase in energy consumption between 2015 and 2018 (+0.5%), even though production at the most energy-intensive sites increased. Overall, the Group's energy intensity declined by 11.2% (energy consumption/revenues) during that period.

To achieve this energy efficiency, various audits were conducted at some of the sites with the highest consumption and have given rise to reduction programmes. In France, a programme involving specific audits and energy performance initiatives was rolled out across a number of the Group's sites in 2018, leading to the identification of more than 200 actions that will be pursued and monitored in 2019.

At the same time, work by the working groups on energy performance and the reduction of CO_2 emissions related to the Group's industrial operations resulted in a 2018 climate change awareness campaign targeted at the heads of the Group's industrial segments. The campaign will continue in 2019 with a new action plan to reduce CO_2 emissions.

In recent years, Thales has also been actively pursuing initiatives to improve the energy performance at its computer data centres and data rooms. These efforts have led to a reduction in PUE at the sites with the greatest impact, including Elancourt, where PUE[3] has fallen from 2 to 1.6 since 2011.

> **CHANGE IN ENERGY CONSUMPTION***

	Fossil-fuel consumption	Ratio by revenues	Total consumption
2012	24	13.6	163
2015	21	11.2	152
2018	20	10	154

- Total consumption (in thousands toe)
- Fossil-fuel consumption (in thousands toe)
- Ratio by revenues (toe/€m)
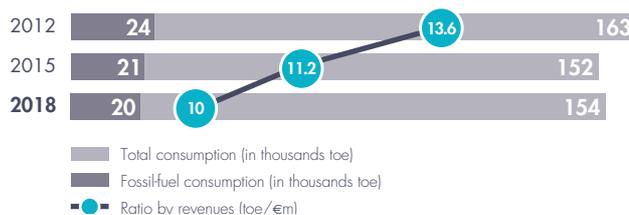
* At constant 2012 scope.

At the same time, some Group entities have been awarded ISO 50001 certification for energy management systems. At the end of 2018, a total of 30 entities were certified, encompassing 27% of the Group's workforce.

The Group's carbon footprint has also been reduced by restricting the use of fossil fuels (gas, fuel oil and coal), with their consumption in relation to revenues continuing to fall in 2018 (down 34% compared with 2012). The percentage of electricity from renewable sources was unchanged from 2017, representing 17% of electricity consumption in 2018.

Refurbishing and renovating certain buildings to higher ecological standards and changing equipment and consumption habits are all measures taken to improve energy efficiency and thereby help to reduce direct CO_2 emissions. Environmental criteria are included in decisions about buildings, new facilities and equipment (architecture, materials, technical building management, comfort, access, etc.) and energy performance is optimised. The energy efficiency of industrial processes has also been optimised where possible. Along with energy, products with high global warming potential, used mainly in refrigeration systems, are subject to monitoring and reduction plans.

Lastly, to limit greenhouse gas emissions, many sites continued to replace high-emission refrigerants with equipment containing less polluting refrigerants.

Particular attention is paid to sulphur hexafluoride (SF_6). This gas, used in a specific industrial process to insulate electronic tubes during high-voltage tests, has very high global warming potential. It is used by very few sites; those that do use it have implemented ambitious plans to reduce emissions, such as manufacturing tubes without using SF_6 or modifying equipment using this gas. They have also rolled out training and awareness campaigns for relevant employees on the environmental impact of SF_6 and/or implemented specific monitoring of incoming and outgoing SF_6 by workshop. This helped reduce emissions by 89% between 2012 and 2018. In 2018, SF_6 only accounted for 5% of CO_2 emissions due to refrigerant fluids, versus 11% in 2017.

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(1) Business Proposals for COP21: proposals signed by 59 companies which committed to contributing to the low-carbon transition by demanding constructive dialogue between states and companies, a carbon price to be set, increased investments in the search for low-carbon solutions and a step up in R&D and innovation.

(2) French Business Climate Pledge: on the eve of the One Planet Summit on 12 December 2017, 91 French companies of all sizes and from all sectors announced the signature of a shared commitment to climate. Each of these companies put forward its actions as a committed player in the fight against global warming.

(3) PUE: Power Usage Effectiveness – an indicator that qualifies the energy efficiency of an IT operating centre.

5.5.3.3 Reduction of greenhouse gas emissions from operations

In order to reduce its CO_2 emissions, Thales is increasing efforts specifically with regard to energy, substances and transportation.

In 2018, it continued the work that it began in 2017 to assess CO_2 emissions related to the use of products and services sold. Within the framework of the dedicated working group (see section 5.5.3.1), a methodology was established for assessing use phase-related CO_2 emissions based on actual consumption data and on scenarios for standard vehicle use. The first estimates of CO_2 emissions related to the use phase of products placed on the market in 2018 were 22 10^6 tCO_2eq with estimated overall uncertainty of 30%.

Data obtained during the study will be fine-tuned in 2019 to determine the ambitious but achievable CO_2 emission reduction targets for each of the Group's product lines and services.

Thales encourages its partners to adopt a responsible attitude regarding climate change. To illustrate its commitment, Thales is a member of the Carbon working group of the French Aeronautics and Space Industry Group (GIFAS) and is participating in the greenhouse gas working party of the International Aerospace Environmental Group (IAEG) to define international emissions accounting standards. During the year, the IAEG's work led to the updating of the standard methodology guide for reporting greenhouse gas emissions as well as the launch of a study to create sector guidelines for calculating CO_2 emissions related to the purchase of goods, services and capital goods.

Thales is also increasing its initiatives to reduce emissions from business travel by making use of a travel policy, modern information technologies, carpooling, electric vehicles and travel diagnostics and by highlighting the benefits of alternative means of transport to its employees and efficient communication tools. For example, a car-sharing pilot test is being set up in the Paris region involving cars, some of them electric, used to travel between sites.

In addition, when allocating or replacing company cars, the company gives preference to models emitting less than 120g of CO_2/km.

In 2018 a survey was conducted of all Group employees regarding their commuting habits. The study received responses from 21% of employees and will be used in 2019 to pursue the Group's efforts regarding travel between home and office.

5.5.3.4 Adapting to climate change

The approach adopted by Thales for adapting to climate change is designed to reduce the Group's vulnerability to such related impacts as extreme weather (storms, floods, etc.), seismic events or resource scarcity.

Over the past few years, Thales has assessed the exposure of Group sites to natural disasters as part of annual site visits focused on prevention. This analysis consists not only of identifying the potential risks of flooding, storms and earthquakes, but also of identifying the consequences of these events in terms of environmental impact, property damage, business continuity, etc.

Thales has mapped its risks related to water at around 160 sites worldwide. The analysis of existing and future risks included the social dimension (access to water and sanitation, availability of water for local inhabitants), economic aspects (conflict of use) and environmental concerns (water consumption relative to the level of water stress in the river basin). Only 10 sites are located in vulnerable areas. The majority of them are offices, whose low water consumption only has a very minor impact. Thales is currently looking into extending this analysis to the mapping of its critical suppliers so it will be in a position to assess its exposure to the risk of natural disasters for its supply chain.

Thales is also involved in the study being conducted jointly by AFEP (French private companies association) and French think tank the Shift Project to analyse energy and climate scenarios. The study will be accompanied by a set of recommendations that will be issued to companies. A total of 15 AFEP members are involved in the study, which aims to produce a factual assessment of the situation based on common observations and gain more understanding of climate change, which will be a major topic of reporting for companies, including Thales, in the years to come.

5.5.4 Product and system solutions for the environment and for customers

Thales has embarked on a process to develop products and systems that meet different needs, specifically:

- compliance with and anticipation of environmental regulations for the purpose of managing obsolescence and the associated industrial risk;
- creation of value for customers and differentiators for the market through innovation;
- reduction in environmental impacts and compliance with the Group's commitments.

The three main guidelines of this process are:

- consideration for the environment throughout a product's life cycle;
- the development of features to improve customers' environmental performance;
- the development of products that strengthen the control and understanding of environmental issues.

The process is combined with other key processes undertaken by the Group, which include the Product Policy, Engineering, Industry and Purchasing. The Group is also developing methods and tools, including guides, questionnaires, check lists, calculators, databases and impact analyses, to help product designers and architects make eco-responsible

choices, leverage environmental information and verify that chosen solutions comply with regulatory requirements.

In 2018, environmental impact analyses performed on products made it possible to characterise key parameters based on the products' nature and use. Besides the necessary replacement of hazardous substances, it emerged that for almost all products, it was the use phase that generated the most significant impacts, particularly in terms of CO_2 emissions. Furthermore, the analyses revealed a strong correlation between CO_2 emissions and other environmental impacts, which in turn identified what will be needed to drive action.

For products built into mobile platforms, the main parameter in terms of environmental impact was the nature of the platform's movement (within the Aerospace, naval, rail sector, etc.) and its profile (service life, percentage of time spent in motion, etc.). This was largely due to the impact of the weight being moved and, to a lesser extent, the platforms' consumption.

The smaller the mobility of the platform, the more the use-phase consumption must be taken into account, to the point where movement becomes the only truly significant parameter for fixed equipment or equipment with a high use rate.

Creating awareness of environmental issues and taking these into account in new product development are an essential part of eco-design policy. In 2018, the company developed training and educational materials primarily for engineering teams and product policy managers. Pilot training sessions were conducted at various sites to consolidate these materials and prepare them for roll-out starting in 2019.

5.5.4.1 Obsolescence and value creation

The increase and changes in environmental regulations (RoHS, REACh, TSCA, etc.), which have led to the restriction and in some cases prohibition of the use of certain substances, have increased the risk that equipment or systems may not be able to be manufactured and supported throughout their life cycle. For this reason, Thales has taken a proactive approach to its processes and practices which involves anticipating risks and implementing the measures required to manage them.

This approach relies on centralised regulatory monitoring, which is constantly increasing in scope, and the resulting information is then summarised and disseminated in the form of an alert to the Thales players concerned. All of these data are entered into Thales's central database, which is accessible to all group entities, as well as the PLM (Product Lifecycle Management) and ERP (Enterprise Resource Planning) systems. An analysis tool developed by Thales makes it possible to cross-reference all of this information to ensure, first and foremost, compliance with regulations and then secondly to perform the impact analyses needed to anticipate the risk of obsolescence.

Thales also endeavours to identify replacement products and processes if a hazardous substance presents a risk or might be banned. Substitution plans have been introduced to manage this issue, in light of the potential impact a ban on certain chemicals could have on Thales's processes and equipment. These investigations into replacements, produced internally or with manufacturing partners, aim to assess the performance of alternative industrial processes and ensure that manufactured products remain compliant with technical requirements. In some cases, it is necessary to redesign products and interfaces and rescope industrial tools.

In the case of chromates, for example, Thales began researching replacement processes in 2013 for more than 30 industrial processes used in its applications, making sure that its subcontractors would have the ability to handle them. To date, the company has allocated more than €6 million to this research and the roll-out of replacements in equipment and systems. It continues to monitor the progress of these replacements, which were between 30% and 90% complete at the end of 2018, depending on the segment, to ensure completion by the required deadline.

For this approach to be sustainable, consideration of environmental issues in product development must be accompanied by value creation for customers. This is primarily addressed through the company's product policy and its approach to eco-design. In the case of most Thales products, environmental impact mostly occurs during the use phase of equipment and systems at customer sites. Consequently, eco-design initiatives are aimed at simultaneously strengthening the value proposition to the customer (better operating conditions, lower total costs of ownership, optimised end-of-life management) and significantly improving the environmental situation.

A cross-functional Steering Committee, coordinated by the HSE Department and comprising HSE coordinators from all the GBUs, ensures responsible management.

5.5.4.2 Understanding and limiting the effects of climate change

5.5.4.2.1 Measuring and understanding the effects on the environment

Thales has been involved in the development of satellites, optical instruments and high-performance radar to monitor the environment and climate change since 1974. As such, it is a key player in observing the earth, understanding climate change and monitoring the environment.

Examples include the entire family of geostationary weather satellites, optical instruments for monitoring vegetation, Envisat/MERIS hyperspectral imaging for the colour of water, the ERS and COSMO-SKyMed radar satellites, the ASAR instrument, TOPEX/Poseidon and Jason-1, 2 and 3 altimetric satellites and radar instruments used in oceanography, IASI atmospheric instruments, and ice observation radar (CryoSat). Today, Thales Alenia Space is in charge of the Sentinel radar (Sentinels 1A, 1B, 1C and 1D), the oceanography Sentinel-3 (Sentinels-3A, 3B, 3C and 3D), and Sentinel-6/Jason CS (instrument inherited from Poseidon, world leader in space altimetry).

Objectives	Project
Study of the topography of oceans and continental surface waters	SWOT (Surface Water and Ocean Topography) is a major breakthrough in a segment with very high strategic, economic and societal stakes. In **oceanography, the satellite will provide measurements of ocean surface and wave height with higher resolution than its predecessor Jason satellites**, resulting in more accurate models of the interactions between oceans and the atmosphere. **The hydrology mission will evaluate continental surface water, to study changes in water storage in humid zones, lakes and reservoirs, as well as flow rates in rivers**. The satellite structure has been delivered and the sub-system that makes it possible to expedite the satellite's disintegration into the atmosphere far from any inhabited area or maritime routes was completed in 2018. **This sub-system will be the world's first platform to carry out a controlled re-entry of a satellite at the end of its life, leaving no debris in orbit**, in compliance with the law on space operations that will enter definitively into force in 2020. The satellite is scheduled for launch in 2021.
Report on greenhouse gas emissions	Between 2012 and 2016 under the **BridGES industrial chair** and then **from early 2018 under the Trace industrial chair** which succeeded it, Thales Alenia Space conducted research with climate scientists, most notably from France's Laboratory of Climate and Environmental Sciences (LSCE) and Dynamic Meteorology Laboratory (LMD), on **optimising space mission concepts related to modelling** (inversion, transport and radiative transfer models) with the goal of **measuring anthropogenic emissions of greenhouse gases CO_2 and CH_4**. Thales Alenia Space has also led, and continues to lead, research with the French National Centre for Space Studies (CNES) and the European Commission (ongoing CHE: H2020 project), and internal development projects.
Mapping of terrestrial vegetation fluorescence to measure photosynthetic activity	At the end of 2018, Thales Alenia Space signed a contract with the European Space Agency (ESA) to lead the **Fluorescence Explorer (FLEX) satellite mission** as well as a novation agreement to incorporate the contract that ESA initially awarded to Leonardo to develop the **FLORIS instrument**. Leonardo's FLORIS instrument is a high-resolution imaging spectrometer that will **capture light emitted by plants and break it down into its constituent colours**. The sensor can then identify the faint reddish glow emitted during photosynthesis, normally invisible to the naked eye, and **accurately identify the fluorescence of vegetation**, allowing researchers to evaluate **the health of the earth's ecosystem**.
Measuring anthropogenic CO_2 emissions	The programme set to position Europe as a major (and independent) contributor to **anthropogenic CO_2 emissions measuring is CO2M**, the future **Copernicus** mission that is still being defined. CO2M follows on from the studies carried out for Carbonsat and will be the only imager for CO_2, with a radius of approximately 200 km. Its advantage over other sounders is that **it will be able to cover considerably more anthropogenic emissions in a single pass**, so that **work can start on addressing these emissions**. As part of the future CO2M-Copernicus programme, Thales Alenia Space is currently assessing **various instrument concepts for phase A/B1 that will be best suited to the specifications** provided by the ESA.

5.5.4.2.2 Control and prevention

Some of the observation methods mentioned above are also used for control and prevention, helping to improve the management of fishery, agricultural and forest resources. They are supplemented by monitoring systems set up on ships and aircraft. Examples of some of the specific items that are monitored so that action can be taken as needed to protect the environment are:

- pollution and tracking of pollution movements;
- forest fires and beach erosion;
- deforestation;
- illegal exploitation of mines or natural resources.

5.5.4.3 Eco-responsible products and innovation

5.5.4.3.1 Environment and product life cycle

Thales relies on a holistic approach that takes into account a product's entire life cycle, from extraction of raw materials up to disposal of the product at the end of its life, as well as all environmental criteria (consumption of raw materials, water and energy; discharges into water and air; waste production, and so on). Research conducted in recent years to characterise Thales's main products has identified two priority areas for improvement:

- the use of sustainable resources for product design and manufacturing, with particular focus on anticipating regulations on hazardous substances in new development;
- the reduction of product energy consumption and CO_2 emissions.

5.5.4.3.2 Sustainable resources and replacement of hazardous substances

The Group's overall approach to design, aimed at reducing the weight of its products, helps to minimise resource consumption. Relying on standard dimensions for plates and structural sections means fewer "shavings". The use of new technologies, such as additive manufacturing, combined with the use of topological optimisation tools, limits the consumption of materials for a given need.

Thales also pays close attention to the availability of critical resources and responds to surveys conducted by European and French authorities.

Any substances that might be banned as a result of regulatory changes are monitored particularly closely (see section 5.5.4.1).

5.5.4.3.3 Eco-design to help the environment

The table below contains examples of products for which environmental impact reductions have been achieved as a result of following the measures discussed above:

> **Performance related to the anticipation of environmental standards in product design (NFPS):**
>
> Assessment of the reduction in products' environmental impact: **1 eco-product** representative of each activity segment

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Improvement type	Product	Action and results obtained
Reduction in the weight of moved equipment, consumption and cable length	Reduction in moved weight in the land sector with the **new Sophie camera**, unveiled at Eurosatory 2018. (LAS GBU)	The general eco-design strategy for tactical products naturally focused on the need to improve user comfort. The new product architecture has **reduced the product's absolute weight by almost 40% to 2.5 kg**, while improving its technical performance. A further reduction comes from the integration into the camera of features previously provided by other devices (e.g. optical binoculars). **For equivalent functions, therefore, the weight saving exceeds 60%.** Over the entire life cycle, and for this small piece of equipment alone, hundreds of litres of fuel and more than one tonne of CO_2 are saved by the platforms that receive users and their equipment. Meetings with users ensured the equipment met operating needs.
	Reduction in the weight and length of cables in the naval sector with the **integration and miniaturisation of RESM (Radar Electronic Support Measurement) systems** for surface vessels. (DMS GBU)	The latest generation dedicated to medium-size frigates will see its weight reduced by nearly 50% for the second time. Overall, **weight will have been reduced by 75% in under 20 years.** The cable length of these systems was initially 2 kilometres. **It has now been reduced by a factor of three.** These gains once again are reflected in a reduction in ships' weight and consumption, amounting to several hundred tonnes of fuel and CO_2 after 20 years of navigation.
	Reduction in the weight and electrification of aircraft in the Aerospace segment with **TR5000 energy conversion equipment.** (AVS GBU)	Development teams have succeeded in **reducing weight by approximately 7%** compared to the previous version. Furthermore, **energy efficiency has improved by almost 30%** to exceed the **threshold of 1,000 W/kg.** In practical terms, this helps control the effects produced by the installation of increasingly powerful on-board energy systems.
	Expansion of **efforts regarding weight and equipment** in the Aerospace segment. (AVS GBU)	An example would be **version 3 of the IESI** (Integrated Electronic Stand-by Instrument) which **saved more than 20% in weight and more than 35% in consumption** compared with version 2.
"Eco" mode	Possibility to **switch to "eco mode"** if mission is compatible with SMART L radar. (LAS GBU)	It is equipped with a liquid cooling system and temperature control unit. An "eco mode" compatible with the mission's constraints **reduces consumption by 50% while slowing down the ageing of critical components.** This feature, which was not requested by the customer, was identified during development as a way to optimise the overall system.
Revisions to equipment architecture	Reducing consumption and weight by leveraging initial impact analyses. (SIX GBU)	With regard to the development of secure communications equipment, impact analyses have made it possible to define **more ambitious targets for reducing consumption and weight than those initially required.** These are currently being carried out, largely by **revising the equipment's architecture** to improve the consumption/performance ratio.

Improvement type	Product	Action and results obtained
Innovations geared towards the environment	Multiple innovations geared towards the environment with the *Stratobus* project. (Space GBU)	Launched in 2016, *Stratobus* is an autonomous geostationary stratospheric platform designed for a wide range of applications such as border and maritime surveillance, boosting GSM network capacity for public events and augmenting GPS over areas of dense traffic. It **runs on solar energy only and does not require a launcher to be put into position.** It is made from **recyclable subsystems** and the **use of hydrogen or helium considerably reduces the risk of pollution** in the event of an accident. It features many innovations, including **a power-generation system** (coupling the solar panels to a solar power amplification system patented by Thales) and an **ultra-light reversible fuel cell for energy storage.** Successful testing of **innovative, ultra-light, flexible and high-performance photovoltaic modules** was completed during 2018. They have a mass of less than 800 g/m² and provide power in excess of 200 W/m². *Stratobus* is scheduled for development in 2019 for a maiden flight at the end of 2022.
	Eco-design of a satellite under the ESA's GreenSat project. (Space GBU)	Thales has also been selected to participate in ESA's GreenSat study. The study focuses on eco-designing a satellite **based on a life-cycle assessment (LCA) to reduce its environmental impact as much as possible.** The LCA produced for the benchmark mission (Sentinel 3) identified the main hot spots and defined targeted strategies to remedy them. After a quantitative analysis of the benefits of each eco-design, the options were filtered and shortlisted. In the final stage of the GreenSat project, **the three best strategies will be built into the satellite** and development road maps will be drawn up to increase the maturity level of these concepts.

5.5.4.4 Innovative climate solutions

5.5.4.4.1 Solutions for reducing customers' environmental footprint

The solutions offered by Thales to air and land transport operators and referred to in the next paragraph are designed to optimise operating efficiency for customers at the same time as limiting environmental impact.

In a different domain, the development of simulators, besides specific eco-design, makes it possible to reduce the number of flight hours required for pilot training. The Reality H helicopter simulator combines the above two benefits thanks to energy consumption that is five times lower than the previous generation. This is due to the use of electrical power that is far more efficient and non-polluting, lighter and recyclable materials, and easier transportation with lower CO_2 emissions.

5.5.4.4.2 Sustainable air and rail mobility

From flying to air traffic management, for over 30 years, Thales has been developing features that improve performance and lower the environmental impact during all flight phases:

- navigational aids to optimise flight paths, take-off and landing phases in particular and taxiing that take weather conditions into account, thus reducing noise, emissions and consumption;

- systems for more fluid air traffic management with less waiting time in airport stacks.

5

The programmes undertaken to achieve these goals are described in the table below.

Programme	Impact
Thales is a contributor to the **European SESAR programme**, which coordinates **R&D in the Air Traffic Management sector**. The sector faces major challenges, including: increasing the safety and capacity of air space and airports; reducing the environmental impact; optimising the road network; sharing information with all stakeholders; and capitalising on ground-to-air exchanges.	Thales helps with **flight optimisation** by **providing more accurate information about an aircraft's position**. Demonstrations have been carried out and the **development of the certified software functionality was finalised in 2018**, with certification expected in the first quarter of 2019. Some 100 aircraft are to be equipped by the end of 2019, in parallel with the adaptation of airports to the new rules and the training of staff concerned.
In 2018, the European Union's Global Navigation Satellite System Agency (GNSS) officially launched the **EDG2E project (Equipment for Dual Frequency Galileo GPS and EGNOS)** with a consortium led by Thales.	The goal is to **optimise aviation navigation with the Galileo constellation**. This four-year project will develop a dual-frequency mini-constellation receiver for aircraft that will **enhance navigation capabilities**, support standardisation and help prepare for certification.
Also in 2018, Thales signed the **OneSKY programme in Australia**, which will offer a **global solution for controlling civil and military air traffic across 11% of the globe**.	The choice of **preferred routes** will take account of the **type of aircraft, and fuel, weight and wind loads**. The reduction in fuel consumption will lead to a **reduction in CO_2 emissions** as well as a **reduction in noise pollution** around airports.

In today's increasingly urbanised world, creating sustainable conditions for urban mobility and inter-city travel is one of the most effective ways to reduce CO_2 emissions. Thales provides operators with transport systems that simplify access to transport through interconnected public transport, improve traffic flow, reduce consumption and increase network capacity by reducing journey times.

For example, the Green SelTrac® CBTC solution reduces a train's energy consumption by 15% by loading efficient speed profiles into the train's on-board system, allowing it to continue running under its own momentum whenever possible. The ATSsoft Energy Saving solution takes advantage of interactions between trains to save energy by optimising real-time traffic management: use of slow speed profiles when the operating circumstances permit and optimisation of current recovery from train braking by synchronising the acceleration of some trains with the braking of others.

In 2018, Thales finalised the acquisition of Danish company Cubris (GTS GBU), a leader in Driver Advisory Systems (DAS) for main line trains. DAS allows for the real-time, fully secured exchange of information between the railway system and the train driver in order to optimise the driving of the train and reduce CO_2 emissions. These systems are a key technology for the future autonomous train. Cubris has developed and delivered a well-recognised Driver Advisory System called GreenSpeed™, which is already in service in Denmark (DSB and Lokaltog), the UK (South West Trains) and Sweden (Transdev). It is currently being implemented by Transdev in Germany and by Finnish Railways (VR) in Finland.

5.5.4.4.3 Smart city

Data analysis makes cities function more efficiently. Thales's solutions collect data on such parameters as water and energy consumption, subscriptions to various public and private services, and transport users, allowing city authorities to improve residents' quality of life and reduce their environmental footprint. Through its data analysis solutions, Thales helps city planners and managers:

- leverage the gigantic data reservoirs of the connected city – smartphones, street lighting, transport, billboards, access to public places, surveillance cameras, etc. – to better understand and anticipate the needs of residents and offer them services that make their lives easier;

- inform users via traffic information systems, giving motorists and train passengers information on traffic conditions in near-real time;

- manage day-to-day operations more effectively and facilitate the coordination of the various players, especially in the event of an emergency. These solutions also improve the environmental efficiency of cities with regard to water and energy consumption, transport use, etc.

Solution	Impact
PRESTO system (Toronto, Canada)	The PRESTO electronic system, designed and developed by Thales, allows residents of the Greater Toronto Area to travel using the **various means of public transport (train, underground, bus) using a single ticket**, in the form of a contactless electronic card that can be used across the entire network. Statistical analysis applied to the data collected gives an insight into mobility across this vast area, meaning that supply can be tailored to actual needs, new services can be created and the use of public transport can thereby be encouraged.
Implementation of the **CBTC and ISC** systems (Hyderabad, India)	Thales contributes to the Hyderabad programme (India) to become a city where urban public transport is being developed by supplying the new metro system opened in November 2017 with CBTC (Communications-Based Train Control) and ISC (Integrated Communications and Supervision) systems, for the very first time in the country. This environmentally friendly metro should **reduce carbon emissions both through operating on electricity and by limiting high-emission road transport**.

5.5.5 Other environmental indicators

The table below includes a number of items for assessing trends in Thales's environmental performance on a comparable basis. In 2018, the scope comprised 28 countries and 151 sites. This scope represents 97.5% of revenues and 98.75% of the Group's workforce.

2015 is the base year for the 2016-2018 goals.

This chapter was reviewed for fair presentation by Mazars. The indicators included in the table below are subject to a moderate assurance conclusion presented in the detailed opinion in section 5.8 Independent Third Party Report.

	Units	2012-2015 change (at constant 2012/2018 scope)	2016	2017	2018	2016-2018 change
Energy						
Electricity consumption	Thousand toe	−5%	131	132	131	0.3%
Per revenues electricity consumption	Toe/€m	−17%	9.1	8.7	8.5	−11%
Fossil energy consumption	Thousand toe	−11%	21.9	22	20.4	−3.4%
Per revenues fossil energy consumption	Toe/€m	−22%	1.52	1.44	1.32	−14.6%
Total energy consumption	Thousand toe	−7%	155	156	154	0.5%
Per revenues total energy consumption	Toe/€m	−18%	10.7	10.2	9.98	−11.2%
Water						
Water consumption	Thousand cu. m	−11%	1,587	1,593	1,502	−2%
Per revenues water consumption	Cu. m/€m	−22%	110.3	104.4	97.1	−14%
Waste						
Total waste production [a]	Tonnes	−4.7%	14,967	16,080	15,278	1.6%
Per sales total waste production [a]	Kg/€m	−16.8%	1.04	1.05	0.99	−10%
Ratio of non-hazardous waste [a]	%	−9.1%	75	81	79	8.3%
Non-hazardous waste per person [a]	Kg/pers.	−9.1%	159.7	179.5	166.8	3.5%
Non-hazardous waste recycling rate	%	22.4%	50	55	59	−7.8%
Non-hazardous waste recycling rate [a]	%	2%	52	56	58	2.7%
Hazardous waste recycling rate	%	−21.4%	25	32	40	112%
Industrial discharge						
Industrial wastewater discharge	Thousand cu. m	−21%	652	595	627	12%
Air emissions	Tonnes	25%	993	923	325	−65%
CO$_2$						
CO$_2$ emissions from energy use	Thousand tonnes CO$_2$	−13%	187	188	186	−0.3%
Per revenues CO$_2$ emissions from energy use	T CO$_2$/€m	−24%	13	12.4	12.1	−12%
CO$_2$ emissions linked to Kyoto Protocol substances and R22	Thousand tonnes CO$_2$	−4%	27	30	25	−29%
O/w CO$_2$ emissions linked to SF6	Thousand tonnes CO$_2$	−44%	1.6	3.4	1.3	−81%
CO$_2$ emissions from transport (Group-wide)	Thousand tonnes CO$_2$	−3%	81	77	77	−2%
Per revenues CO$_2$ emissions from transport	Kg CO$_2$/€m	−15%	5.6	5.1	5.0	−14%
CO$_2$ scope according to GHG Protocol						
Scope 1 (gas, fuel oil, coal, substances, mobile energy sources)	Thousand tonnes CO$_2$	−9%	82	86	75	−14%
Scope 2 (electricity, steam)	Thousand tonnes CO$_2$	−12%	134	136	138	1%
Scope 3 (business travel by air, rail, road)	Thousand tonnes CO$_2$	−3%	81	77	77	−2%
TOTAL SCOPES 1, 2 AND 3	**THOUSAND TONNES CO$_2$**	**−9%**	**297**	**299**	**290**	**−4%**
TOTAL SCOPES 1, 2 AND 3 PER REVENUES	**TCO$_2$/€M**	**−20%**	**21**	**20**	**19**	**−15%**
Other disclosures						
ISO 14001-certified sites			120	124	118	
Staff concerned as percentage of total workforce	%		89%	89%	89%	

(a) Excluding exceptional waste.

5.5.6 Environmental reporting rules

5.5.6.1 Scope

The consolidation scope of environmental data is based on the financial consolidation scope. However, due to restricted activity and/or workforce or the absence of operational control by Thales, certain establishments have not been included.

In connection with this report, the 2018 indicators are provided at constant scope with 2015.

5.5.6.1.1 Criteria

Only companies meeting the following criteria are included:

Equity interest and operational control

- Thales equity interest of 50% or more;
- Thales exercises operational control over the company.

Companies and joint ventures not meeting the above criteria are not included in Thales' environmental reporting.

Activity/workforce

- "establishment/site" carrying out an activity covered by Operating Model 4, regardless of headcount;
- "establishment/site" carrying out an activity covered by Operating Model 3, with a headcount of more than 50;
- "establishment/site" carrying out an activity covered by Operating Model 2, with a headcount of more than 100.

The instruction "Definition of HSE Management System levels" provides details of the operating model levels (classified according to type of activity: industrial, semi-industrial, tertiary).

Environmental Management System

All "establishments/sites" that are ISO 14001 and/or EMAS and/or OHSS 18001 and/or ISO 45001-certified are included in the reporting scope irrespective of the criteria related to activity.

5.5.6.1.2 Changes in scope

- Disposals/acquisitions: company to be included as soon as one full calendar year has been completed and if the company meets the scope selection criteria.
- New business: company to be included as soon as one full calendar year has been completed and if the company meets the scope selection criteria.
- Inter-site transfers: data taken into account in the reporting:
  – of the departure site from 1 January Y to the date of transfer,
  – of the arrival site from the date of transfer to 31 December Y.
- Intra-Group merger: integration of data for the absorbed entity for the period from 1 January Y to the date of absorption into the data of the absorbing entity.

5.5.6.2 Reporting procedure

The Group-wide reporting system includes an environmental reporting procedure with instructions for each successive stage of data entry, validation and consolidation. It also defines the roles of each person involved and includes the recording of data (traceability, archiving, etc.).

5.5.6.3 Indicators

Environmental concerns change over time. Environmental performance indicators therefore have to evolve to stay abreast of developments and reflect the Group's policy priorities. Different interpretations of certain indicators can lead to conflicting data from different countries. Thales is therefore adapting the indicators to make the environmental reporting system more efficient, building on lessons learned from previous years and refocusing the reporting effort on current and future environmental concerns. The indicators are described in the reporting tool. Information is also available on the calculation of the carbon footprint.

5.5.6.3.1 Reporting tool

An environmental reporting and management tool for the entire scope of consolidation of the Thales group is available on the corporate intranet. This tool consolidates the data from each entity, country and geographic area, and for the Group as a whole. It checks data consistency and suggests country-specific units of measurement, conversion factors, etc. The same tool provides access to the rules for data entry, validation and consolidation defined in the reporting procedure.

5.5.6.3.2 Analysis of performance

For easier analysis of environmental data, the Group reporting system incorporates the following principles:

- changes in scope specifically related to disposals and acquisitions. For each family of indicators, a gross figure is given (e.g. water consumption in cubic metres) and a ratio supplements the information to take account of changes in scope (e.g. water consumption per person);
- Group targets are set for a given period. During that period:
  – changes in performance are assessed on a like-for-like basis (i.e. at constant scope of consolidation),
  – coefficients such as emission factors for CO_2 emissions are constant;
- if emission factors are modified at the start of a new period, the performance data for the reference year are recalculated using the new coefficients;
- the principles and methods for reporting on data are described in the methodological guides to environmental reporting and calculation of CO_2 emissions, which are available in the Group reporting system.

5.7.3 Incorporating the challenges of corporate responsibility in the supply chain

Thales designs and produces integrated solutions consisting of equipment, sub-systems or full systems, most of which are developed with the help of external partners. For example, purchases account for nearly half of the Group's revenues and, in a reflection of the Group's industrial footprint, more than 80% of purchases come from France, Europe and North America.

The quality and reliability of the supply chain therefore actively contribute to Thales's added value and to customer satisfaction, and as a result, the company has to adopt a responsible approach to this issue.

Geographic breakdown of Group purchasing in 2018

European Union (excluding France)	33%
France	41%
Rest of world	26%

€7.04 bm
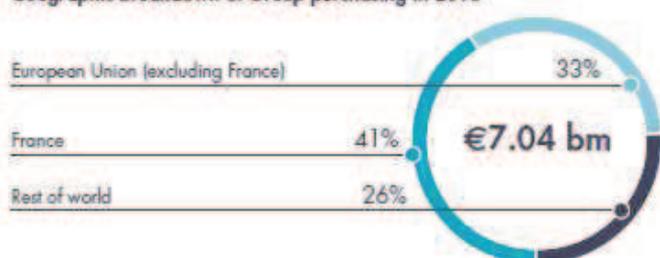
5.7.3.1 Responsible purchasing

5.7.3.1.1 A stringent procurement policy

Thales's procurement policy is designed such that the company works with a base of efficient, reliable suppliers who strictly comply with the domestic and international laws and regulations that apply to them, including international trade rules (export control, for example) and environmental, personal health and safety, ethical and social obligations. This policy and the Group's purchase procedures are applicable to all suppliers and sub-contractors.

This policy is based on ten responsible procurement practices specified in the Responsible Supplier Relations Charter, to which Thales has been a signatory since 2010. The aim of the charter is to develop a balanced relationship based on trust between suppliers and customers in the knowledge and respect of their respective rights and obligations. To this end, the Group has also appointed an internal mediator to liaise with suppliers to avoid or quickly resolve potential conflicts that could arise with them. The Thales internal mediator's actions are also in line with the initiatives carried out by the mediator of the French Aerospace industries association, GIFAS.

In France, Thales's commitment in this area was recognised in 2012 when it was awarded the "Responsible Supplier Relations Label" by the *Médiation des Entreprises* (business mediator) and the *Conseil National des Achats* (French purchasing board). Awarded for a period of 3 years, this label singles out companies committed to forging a structured collaborative relationship with their suppliers based on mutual respect. Thales received the renewal of this label for the period 2015-2018.

5.7.3.1.2 A responsible supply chain

Thales requires its suppliers around the world to adhere to its corporate responsibility approach by signing its Purchasing and Corporate Responsibility Charter. The charter requires them to uphold the principles of its Code of Ethics and those of the United Nations Global Compact and OECD, particularly with regard to Human Rights, labour standards, the environment and preventing corruption.

Thales suppliers must also complete a self-assessment questionnaire that evaluates their corporate responsibility performance (nine questions on labour standards, five on environmental protection, two on corporate governance, one on ethical business conduct and one on export control). They are awarded an overall score which indicates their non-financial performance.

Moreover, as part of the selection process, potential suppliers are requested to complete a self-assessment enabling them to measure the maturity of their environmental management and commit to a process of continuous improvement. This self-assessment may be verified during supplier audits conducted by Thales, which may also lead to a request for an improvement plan, or even to Thales deciding to remove a supplier from its list if certain essential criteria are not met. In this regard, Thales has already been working closely with certain suppliers for a number of years to jointly define and implement progress plans.

To achieve the goal of a responsible supply chain, the Group Purchasing Department set itself the objective of assessing the environmental maturity of all its class A suppliers (all suppliers accounting for 80% of purchasing volume) as well as each of its new suppliers, by the end of 2018. At end-2018, 10,400 supplier sites had undergone this assessment; 84% of the panel concerned were class A.

Year	Number of suppliers that have signed the Purchasing and Corporate Responsibility Charter	Supplier performance in domains of corporate responsibility (labour standards, the environment, corporate governance, business ethics and export control) (*Average score out of 10*)
2018	15,610	8.7
2017	12,700	8.3
2016	10,500	8.7
2015	7,660	8.8
2014	4,400	8.7

Year	Number of supplier sites assessed for environmental maturity	Class A suppliers assessed for environmental maturity
2018	10,400	84%
2017	7,500	67%
2016	4,900	60%
2015	2,400	50%
2014	1,400	36%

During call for tenders phases, environmental responsibility is one of the procurement requirements and is included in the weighted criteria for supplier selection.

These initiatives, which are aimed at developing a more responsible supply chain, are fully in line with the implementation of France's law on contracting companies' duty of care (see section 5.7.3.2).

FOCUS: SPECIAL ATTENTION PAID TO CONFLICT MINERALS

Although Thales is not subject to section 1502 of the US Dodd-Frank Act since it is not listed on the US financial market, the Group nevertheless exercises due diligence when it comes to conflict minerals, to meet customer expectations and comply with its commitments.

Thales submits these queries to its supply chain to ensure that the origin of the metals covered by these regulations (tin, tantalum, tungsten and gold) can be verified to the greatest extent possible.

When Thales identifies suppliers likely to supply items containing these metals, the Group checks whether those suppliers have a policy on conflict minerals and/or an appropriate body to respond to questions on the matter.

Performance related to ensuring supplier compliance with corporate responsibility issues (for 2018) (NFPS):

Supplier performance in the domain of corporate responsibility (average score out of a total of 10): **8.7**
Percentage of class A[1] suppliers assessed in terms of their environmental maturity: **84%**

This performance is fully in line with the multi-year targets set for the upcoming period from 2019 to 2023 that have been finalised in agreement with internal stakeholders.

Sustainable procurement: Goals for 2019-2023	2023 target
Percentage of new suppliers committed to the principles of Thales's new Responsible procurement Charter	100%

5.7.3.2 Duty of care plan

France's law No. 2017-399 of 27 March 2017 on the duty of care of parent companies and contracting companies requires the implementation of "reasonable vigilance measures to identify risks and prevent serious violations of Human Rights and fundamental freedoms, the health and safety of persons and the environment resulting from the activities of the company or those of the companies it controls, directly or indirectly, as well as the activities of subcontractors or suppliers with whom the company has an established business relationship, when such activities are related to this relationship".

Article L. 225-104-1 paragraph 4 of the French Commercial Code requires that the requisite vigilance measures be grouped together in a "duty of care" plan that contains the following:

1. a risk mapping to identify, analyse and prioritise risks (see section 5.7.3.2.1).

2. procedures for regular assessment of the situation of subsidiaries, subcontractors or suppliers with whom the company has an established business relationship, in respect of the risk mapping (see section 5.7.3.2.2).

3. appropriate measures to mitigate risks or prevent serious violations (see section 5.7.3.2.2).

4. a mechanism for issuing or collecting alerts on the existence or occurrence of risks, prepared in consultation with the representative trade unions in said company (see section 5.7.3.2.3).

5. a system for monitoring the measures implemented and assessing their effectiveness (see section 5.7.3.2.4).

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(1) All suppliers accounting for 80% of purchasing volumes.

In financial year 2018, Thales formed an internal, multidisciplinary working group to define the main components of the duty of care plan, also drawing on the work of trade associations of which it is a member.

5.7.3.2.1 Risk mapping related to the duty of care

An initial version of the mapping makes a distinction between the risks resulting from the activities of Thales and its subsidiaries and those resulting from the activities of the Group's subcontractors and suppliers with whom it has an established business relationship:

1. The part related to the activities of the Group and the companies it controls is based on an internal control questionnaire, the Yearly Attestation Letter (YAL), sent out annually (113 questionnaires sent out during 2017) by the Audit, Risks & Internal Control Department (DARCI) to the Group's operating entities. Responses to the questionnaire are analysed by the network of Risk Advisors and audited on a rolling basis by the DARCI. The analysis performed in 2018 of the responses to the questionnaires sent out at the end of 2017 verified that the policies and bodies in place within the Group to address matters related to the environment, the health and safety of persons, respect for Human Rights and fundamental freedoms would reasonably contain any major risk related to the activities of the operating entities.

   The YAL is updated annually.

2. Turning to subcontractors and suppliers with whom the company has an established business relationship, those identified as presenting a risk fulfilled the following combined criteria:

a) they belong to one of the 17 purchasing categories selected by Thales as presenting the greatest risks in terms of Human Rights and fundamental freedoms, the health and safety of persons and the environment (installation and construction work, subcontracting of surface treatment, etc.);

b) they are located in a country considered to present risks in terms of Human Rights and fundamental freedoms, the health and safety of persons and the environment; a list of countries at risk has been compiled from external sources to allow a rigorous and objective assessment of the countries' policies in this area[1];

c) revenues with Thales exceeding certain materiality thresholds.

   This approach is designed to divide the Group's top suppliers and subcontractors into three risk categories: low, moderate and substantial.

5.7.3.2.2 Description of the procedure and appropriate actions to mitigate risks or prevent serious harm

The procedures for assessing the business activities of Thales, its subsidiaries and the companies it controls are based on the YAL questionnaires and their subsequent analysis (see section 5.7.3.2.1 above) and on the TIMS maturity assessments (see section 3.4, "Control environment").

With regard to assessment procedures for subcontractors and suppliers, the current plan being rolled out is based on the following:

- a Purchasing and Corporate Responsibility Charter. In 2018, a total of 15,610 suppliers signed the charter, versus 12,700 in 2017 (see section 5.7.3.1.2).

  At the end of 2018, Thales launched a project to revise the charter, drawing in particular on the Code of Conduct of the International Forum on Business Ethical Conduct (IFBEC) prepared by the main European and US players in the aerospace and defence sector;

- a more comprehensive supplier risk assessment questionnaire: until 2018, Thales's suppliers completed a self-assessment questionnaire measuring their performance in domains of corporate responsibility (see section 5.7.3.1.2). That questionnaire was updated and expanded in 2018, in conjunction with the International Aerospace Environmental Group and GIFAS. The new version will be rolled out in 2019 to provide a more accurate assessment of the policies and measures implemented by the Group's subcontractors and suppliers in the domains covered by law No. 2017-399 of 27 March 2017 on the duty of care of parent companies and contracting companies;

- supplier site audits carried out by Thales's Procurement Department on quality and technical aspects. These also include some twenty points dealing specifically with HSE issues and the supplier's ability to safeguard the environment, ensure the safety of facilities and persons and manage products responsibly.

At this stage of the implementation of the above-mentioned law, it is expected that:

- **subcontractors and suppliers at low risk** shall not be subject to any specific additional measures (other than signing the charter during the selection phase);

- **subcontractors and suppliers at moderate risk** shall complete the new supplier risk assessment questionnaire;

- **subcontractors and suppliers at substantial risk** may be subject to a specific assessment to remove any doubts about their ability to reduce and manage their risks of serious violations of Human Rights and fundamental freedoms, the health and safety of persons and the environment. Depending on the results of this assessment, the Group then reserves the right either to continue the business relationship without additional measures, or to assist the subcontractor or supplier in implementing a risk mitigation plan, or to terminate the business relationship.

5.7.3.2.3 Mechanism for issuing and dealing with alerts

In 2018, Thales reviewed its internal alert system to bring it into compliance with France's law No. 2016-1691 of 9 December 2016 on transparency, anti-corruption and economic modernisation, and law No. 2017-399 of 27 March 2017 on the duty of care of parent companies and contracting companies.

This process led to the extension and increased security of the alert system so that it could receive all internal or external alerts falling within the scope of these laws. The new alert mechanism was drawn up in consultation with Thales's representative trade unions.

5.7.3.2.4 Procedures for monitoring the measures in the duty of care plan

The measures in the duty of care plan are currently assessed using the following indicators (see sections 5.6.1 and 5.7.3.1.2);

- number of suppliers that have signed the Purchasing and Corporate Responsibility Charter: 15,610 in 2018 (versus 12,700 in 2017);

- overall supplier performance score for 2018 in the domain of corporate responsibility: 8.7 out of 10 in 2018 (versus 8.3 in 2017);

- percentage of class A[2] suppliers assessed in terms of their environmental maturity: 84% in 2018 (versus 67% in 2017);

- number of alerts received via the Thales alert system in 2018: 15[3] (versus 16 in 2017).

These indicators will be expanded in 2019.

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(1) International Trade Union Confederation Global Rights Index 2018, Yale University Environmental Performance Index, 2018 Global Slavery Index and the Human Rights Watch World Report 2018.
(2) All suppliers accounting for 80% of purchasing volume.
(3) Of the 15 alerts received in 2018, 10 were related to labour relations as part of the duty of care employee-related field and one was related to the duty of care environmental field (allegation of noise pollution).