2012 ENVIRONMENTAL REPORT

Taghleef Industries

SUMMARY

1. CEO STATEMENT

During the past few years, Taghleef Industries Group has experienced successful growth that led it to become one of the most prominent manufacturers of biaxially oriented polypropylene (BoPP), cast polypropylene (CPP) and biaxially oriented polylactic acid (BoPLA) films, primarily used for food packaging, in the world.

As an industry leader, it is our responsibility to be considerate of market and stakeholder needs. The topic of sustainability has become an ever increasingly popular topic in the packaging industry. Sustainability is a concept that implies a holistic vision that includes social, economic and environmental aspects and represents an indefeasible choice for each company that aims to give equal attention to today and tomorrow commerce. The path towards sustainability requires a constant commitment by the entire company and, in the case of Taghleef Industries S.p.A., it starts from the great attention that we have always focused on environmental aspects.

In fact, for many years, our site has carried out documented measures to limit the environmental impact of its manufacturing process and supply chain. The established targets already achieved and future targets are included in this very first Environmental Report of Taghleef Industries S.p.A. paving the way for future developments.

Improving the environmental impact of our company starts with what we produce.
This is the reason why we are investing in the future and in new technologies in order to create new products using alternative materials such as polylactic acid, which derives from renewable resources, is fully compostable and does not compromise film quality. Likewise we are developing technologically advanced films that are able to improve packaging performance with even lower thicknesses and therefore reducing the volume of raw materials and waste.

The aim of our company is to meet customers' needs, strengthen business relations and guarantee them high quality service, therefore transparency is a necessary characteristic to make it happen.

The publication of this report is the confirmation of the company's future commitment during the years ahead that, added to the ambition of an ever increasing improvement, will be just the first step to achieve new objectives in the years to come.

Valerio Garzitto
CEO *Ti* Europe

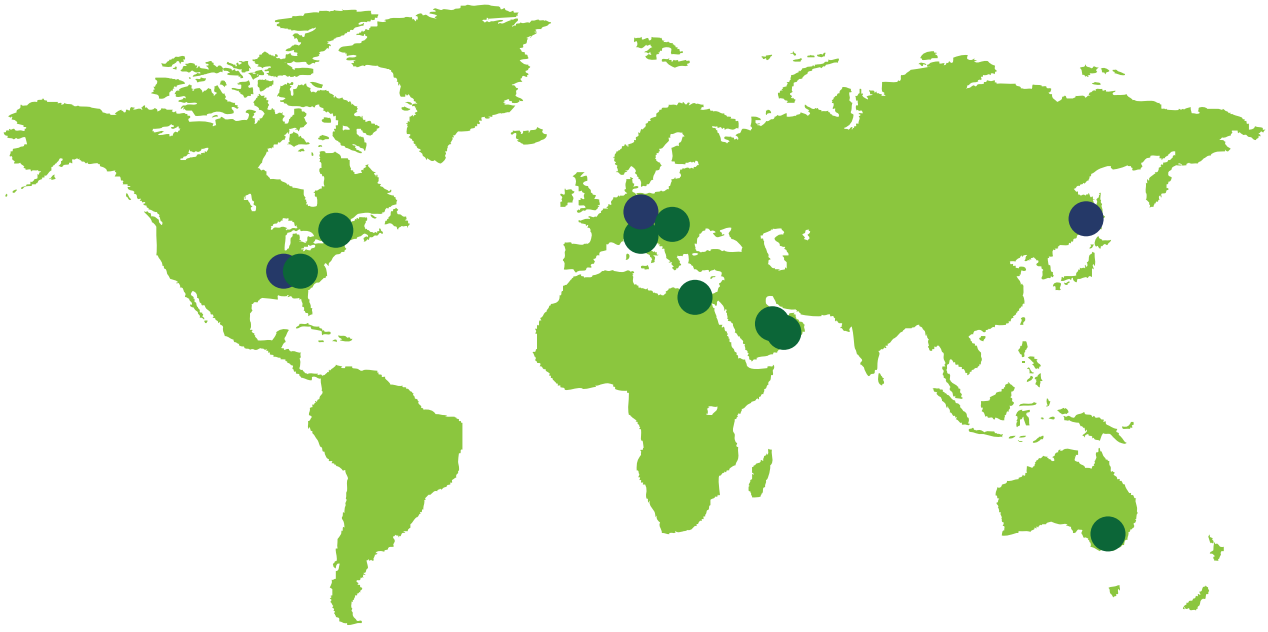
2. COMPANY PROFILE

2.1 DETAILS OF THE ORGANIZATION

Headquartered in Dubai (UAE), Taghleef Industries (*Ti*) is one of the largest manufacturers of BoPP, CPP and BoPLA films in the world with an annual film capacity of 360,000 mt.

The Group was established in 2006 merging the experience and power of three companies: Technopack based in Egypt, Al Khaleej Polypropylene Co. (AKPP) based in Oman and Dubai Poly Film based in the United Arab Emirates (UAE). Taghleef Industries belongs to the privately-owned **Al Ghurair Group**, which operates in strategic businesses such as real estate and shopping malls, manufacturing (packaging solutions and metals) and investments. As the largest producer in the Middle East it has been supplying films for two decades. During the following years, Taghleef Industries commissioned new production lines and expanded its presence in the global market through new mergers and acquisitions, in order to meet the ever increasing domestic and international market demands.

Currently, Taghleef Industries is present in 5 continents with a total of **8 production sites** located in the UAE, Oman, Egypt, Italy, Hungary, Australia, USA, Canada and **3 distribution centres** located in Germany, USA and China. After the last acquisition in the USA, the total number of lines forming Taghleef Industries' technology park increased to 24. Thanks to the company's international network and to its constant investments in people and equipment, Taghleef Industries is now able to supply high-quality products serving world markets.



HAVING A GLOBAL PRESENCE, TAGHLEEF INDUSTRIES IS ALSO INVOLVED IN GLOBAL ISSUES AND TAKES FULLY RESPONSIBILITY ON SUSTAINABLE DEVELOPMENT. IT IS COMMITTED TO CREATING AND OFFERING ALTERNATIVE PACKAGING SOLUTIONS WHILE REDUCING THE ENVIRONMENTAL IMPACT OF ITS MANUFACTURING PROCESS.

2.2 PRIMARY PRODUCTS

The Group's product portfolio offers a wide range of BoPP packaging films suitable for applications as diverse as food packaging (solids, both fresh and dried, liquids and powders), labelling (Wrap Around Labels reel-fed, Wrap Around Labels cut & stack, In-Mould, Self-Adhesive), adhesive tapes and other applications (stand-up pouches for industrial products, pet food supplies, stationery, etc.).

These films are available in transparent, matt, solid white, white voided and metallised and, with their specific characteristics, they aim to satisfy the highest customer request in terms of barrier properties, shelf-life extension, food safety and high-speed packaging machines.

Although it plays a key role in product preservation and distribution, packaging is often perceived by the consumers as an unnecessary waste of resources. There is no doubt that over-engineered packaging makes no sense from an environmental point of view, but several studies have confirmed packaging is necessary and far better than no packaging (less waste, longer shelf life, more efficient distribution to name a few advantages). The challenge is to find the right balance between resources invested in packaging manufacturing and resources saved thanks to its performance. As a result of this challenge, the packaging industry is always looking at technologies to improve this balance, in terms of substrates, manufacturing and packaging formats.

NATÍVIA™
BIO-BASED FILMS

Taghleef Industries supplies a new range of bio-based, compostable and biodegradable BoPLA packaging films branded NATÍVIA™. There are several examples in the market where NATÍVIA™ is being used as an alternative to oil-based plastics, thanks to its environmental benefits:

- Fruit and produce;
- Pasta and rice;
- Window of bread bags;
- Wrap around and self adhesive labels;
- Tray lidding;
- Flower and plant sleeves;
- Adhesive tapes.

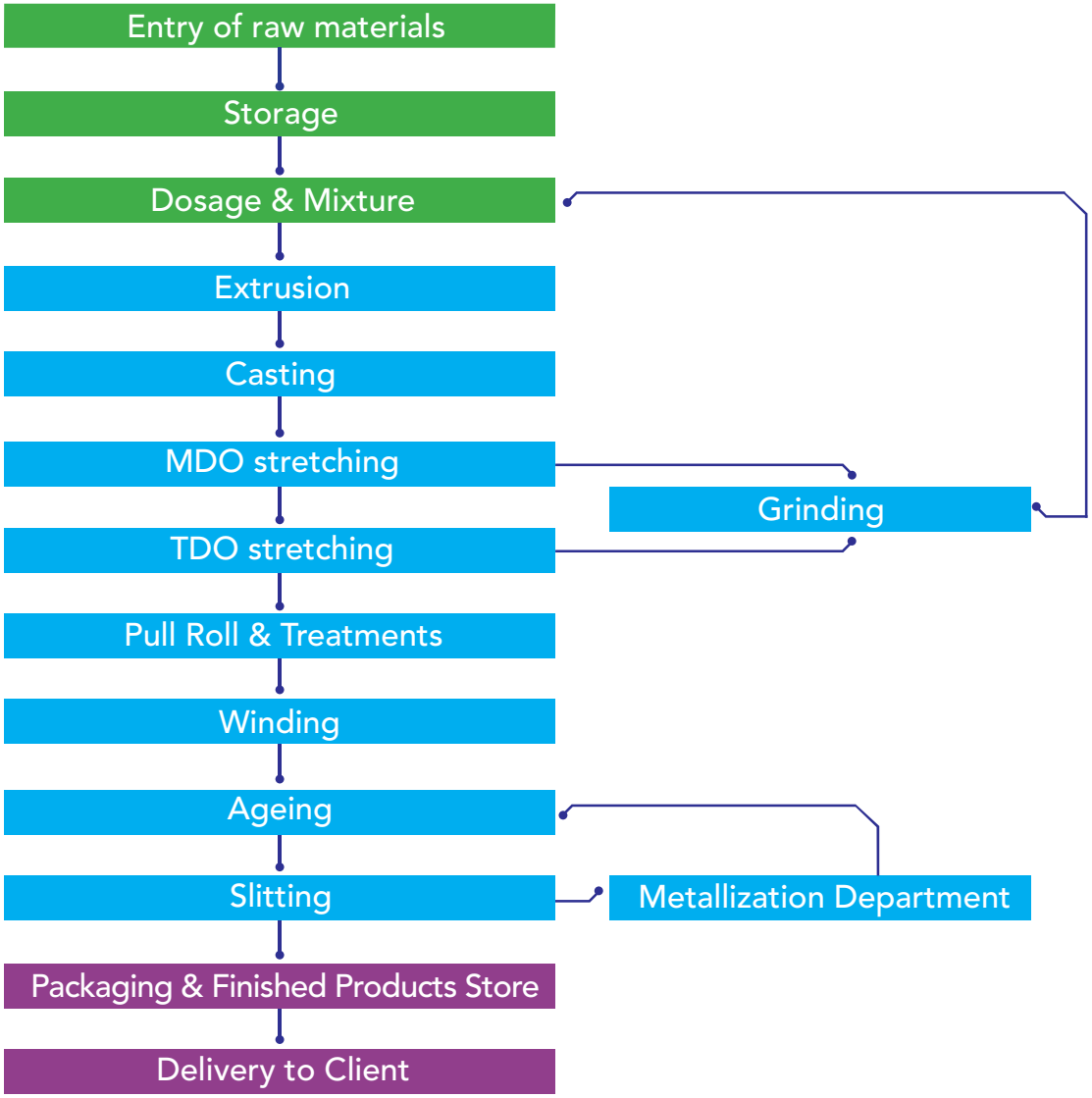
The product properties allow it to be used across most food packaging sectors, including perishables, as well as for lids and non-food applications.

EXTENDO™
THE BARRIER FILM COMPANY

Taghleef Industries has recently developed a new range of high tech flexible films branded EXTENDO™ that are suitable for food, medical and consumer applications. Despite their low thickness, these films assure highly efficient gas and vapour barriers resulting in an effective alternative to reduce packaging waste while making recycling easier.

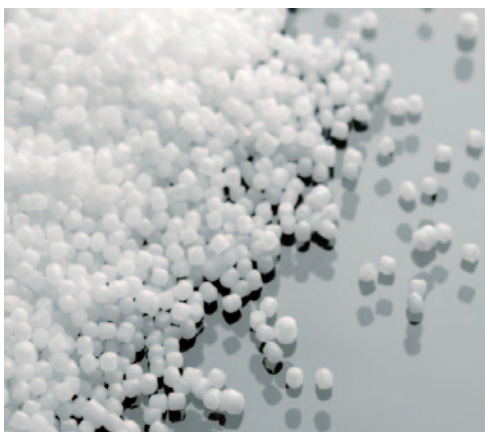
2.3 OUR MANUFACTURING PROCESS

Production Process Flowchart



RAW MATERIALS

The products manufactured by Taghleef Industries S.p.A. derive mainly from two sources: polypropylene (PP) and polylactic acid (PLA). The first one is a thermo-plastic polymer that consists of non-toxic molecules made up of only carbon and hydrogen atoms. The second one is a bioplastic obtained from corn starch or sugar cane that is 100% compostable. During the manufacturing process, the use of highly concentrated additive masterbatches define the specific characteristics of the film. All raw materials used by Taghleef Industries S.p.A. comply with the National and European Union regulations and most of these fulfil also the Food Contact regulations of the USA.



EXTRUSION

Extrusion is the first stage of the transformation process. Polypropylene granules, together with the additives, are appropriately measured, sent to a pre-mixer and supplied to the extruders. Here they are melted and therefore extruded forming a flat sheet that is stabilized thanks to an immediate cooling by contact with a chill-roll and immersion in a water bath and then dried of the remaining surface water. During the Machine Direction Orientation (MDO) the sheet is warmed up again and stretched longitudinally using rolls that rotate at different speeds. Afterwards, the film is locked on the edges by clips and stretched transversely during the Transversal Direction Orientation process (TDO). The output film is now subject to an appropriate surface treatment (flame or corona treatment) to make the product printable and then winded into jumbo rolls, measuring 4 or 8 meters wide.

METALLIZATION

It is an additional process that may be required by the customer. It takes place on a high-vacuum system that deposits a thin layer of aluminium on one of the two surfaces of the film, improving its barrier effect. A slitter provides one or more by-product rolls that are then stored in the finished products warehouse, awaiting shipping. The lateral scraps produced by the slitters during the metallised roll slitting are stored in specific containers and destined to external sale.

REGRANULATION

Regranulation is a scraps reprocessing procedure from which it is possible to obtain the granule, which is then stocked in special silos and will be reused during the extrusion process in variable percentages, depending on the type of product. The scraps deriving from film break-offs (during the stretching process or during the start up of the extrusion lines), slitter scraps, grinding of jumbo rolls or by-product rolls that do not match the standards are all appropriately grinded through grinding machines. The material derived from this process is then sent to an extrusion system through which, by material melting, it is possible to obtain the granule thanks to a specific regranulation machine. The granule is then cooled in a water tank, dried, weighed and sent for stocking to the extrusion line silos.

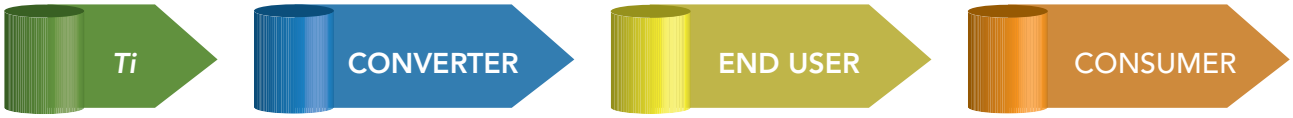
MAIN SLITTING, SECONDARY SLITTING AND PACKAGING

After an adequate seasoning period spent in a heated warehouse, the jumbo rolls are sent to the slitting area where they are cut into multiple by-product rolls that comply with the specifications of the client's order. When in need of additional processing, these rolls are sent to the secondary slitting, before being moved to the packaging area.

3. SCOPE OF THE DOCUMENT

NOWADAYS ENVIRONMENTAL ISSUES ARE ESSENTIAL SUBJECTS FOR A COMPANY THAT IS POSITIONING ITSELF AS A MARKET LEADER PROMOTING A RESPONSIBILITY APPROACH TOWARDS PRESENT AND FUTURE GENERATIONS. THIS ISSUE IS THEREFORE CONNECTED WITH BOTH THE ECONOMIC AND SOCIAL FIELDS AND IS PART OF A WIDER CONCEPT OF SUSTAINABILITY.

Taghleef Industries manufactures a semi finished product that does not reach consumers directly, but it is subject to further manufacturing by companies, known as converters, before being sold to the end users that use it for the packaging of their products.



It is essential to provide our product with specific certifications that show its suitability of use, especially for food applications. In 1995 the company started a path of quality improvement and since 2000 it has been focussing on environmental and health&safety issues with the support of an independent certification body (Det Norske Veritas). The addition of these new steps laid the foundations of a global approach towards sustainability.
(For more details see "certifications" section).

The environmental performance of the company regarding air emissions, water and energy consumption, scraps and waste production during all the stages of the manufacturing process is supported by the improvement objectives already achieved and by those that Taghleef Industries S.p.A. commits to achieve in the future, following the medium term environmental strategy.

4. 2020 ENVIRONMENTAL STRATEGY

Taghleef Industries S.p.A. has adopted the following medium term strategy that sets out **the objectives** that the company is committed to achieve before the end of 2020.

WASTE

0 waste: no type of waste shall be disposed as the company's aim is to identify a recovery path for each of them.
- 50% production waste: the amount of reusable waste materials shall be reduced by at least 50% compared to the amount produced in 2008.
Less hazardous waste: the incidence of hazardous waste shall be reduced by 5% compared to the total amount registered in 2008.

GREENHOUSE GAS EMISSIONS (GHG)

- 20% of GHG emissions: Greenhouse Gas emissions shall be reduced by 20% with respect to the rates registered in 2005 and consistently with European policies and commitments.

WATER

- 20% of water consumption: water consumption per ton of film produced shall be reduced by 20% compared to the figures of 2008.

ENERGY

- 15% of energy consumption: energy consumption (expressed in toe) per ton of film produced shall be reduced by 15% compared to the figures of 2008.

PRODUCTS

More with less

Taghleef Industries S.p.A. will continue to follow the path of collaboration started with its customers for the reduction of the raw materials used in its products without compromising their performance.

Products with a lower environmental impact

Taghleef Industries S.p.A. will continue to cooperate with its customers in the research and development of products to make flexible packaging with a lower environmental impact. Therefore it will continue to analyse the lifecycle of its products and the Carbon Footprint (CFP).

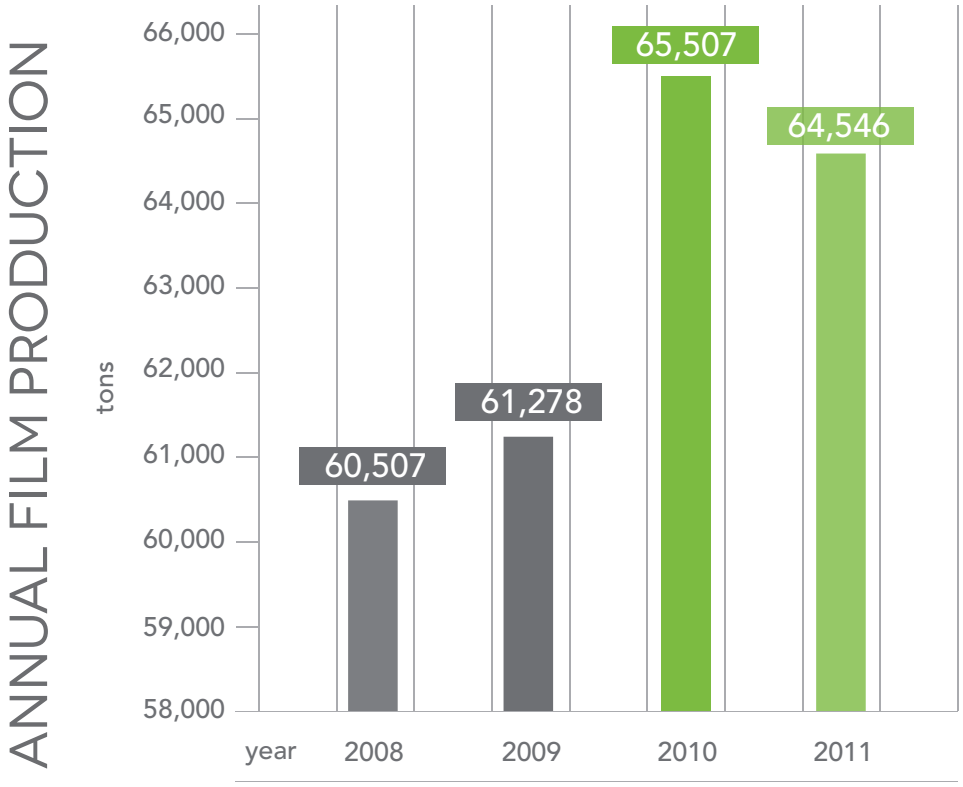
5. ENVIRONMENTAL PERFORMANCES

This section will focus on a list of environmental performance data such as:

- Air emissions
- Water resources
- Waste
- Energy
- GHG emissions
- Product related aspects

In order to make a year over year comparison, data points have been collected starting from 2008 when the plant in San Giorgio di Nogaro was acquired by Taghleef Industries Group.

Relevant data is expressed by product unit making reference to the following yearly production rates:



Annual films production rates.

5.1 AIR EMISSIONS

Air emissions produced by Taghleef Industries S.p.A. manufacturing plant derive mainly from the extrusion, stretching and film surface treatment stages.
The polluting substances emitted by the 64 emission points and regularly authorized by the competent regional bodies are:

- total dust
- ozone
- formaldehyde
- mineral oils (such as fumes or fog)

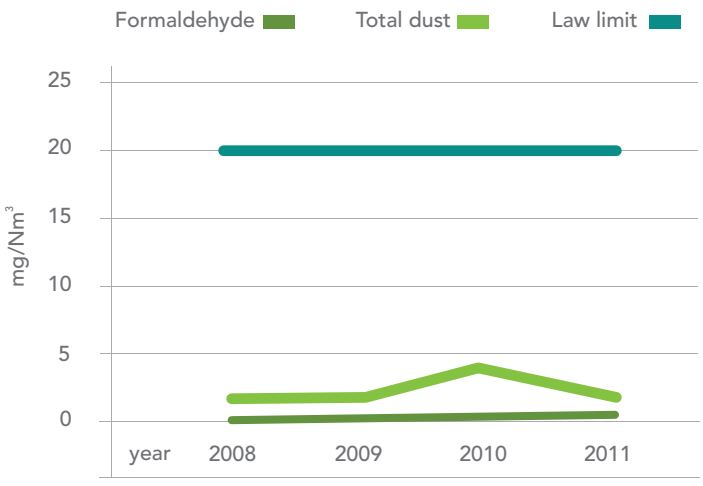
In addition there are the classic emissions that characterize the heating system and are periodically checked as per the regulations in force.
In order to respect the limits defined by law, emissions are managed using specific abatement plants, depending on the type of pollutants detected in the various flows. On the other hand, formaldehyde emissions are not subject to the abatement process because their rates are far below the law limit.

The air emission treatment plants are related to:

- dust abatement using cyclone and bag filters
- ozone abatement using activated carbon scrubbers
- oils abatement using coalescing filters

Below there is a list of average rates registered for each pollutant during the four-year period with respect to the authorized limit of emissions. As a precautionary measure, when the level of pollutant was below the limit of analytical detectability, it was considered to be equal to the limit itself.

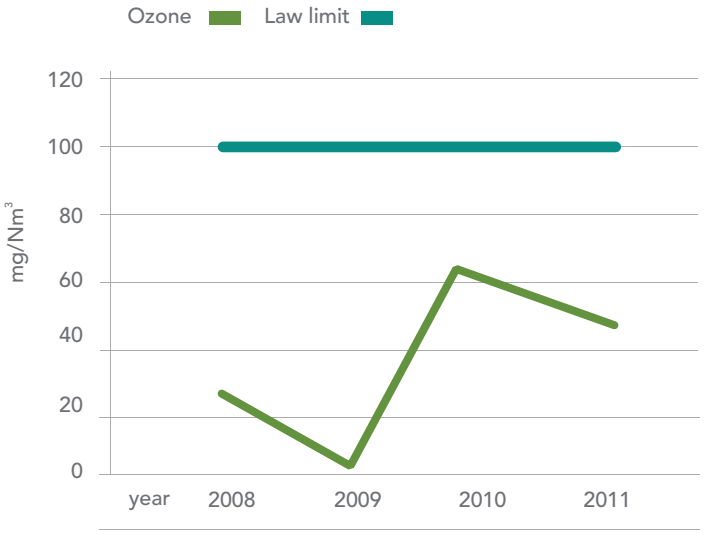
EMISSION OF TOTAL DUST AND FORMALDEHYDE



Annual average concentration levels of dust and formaldehyde detected in the chimneystacks with respect to the law limit.

Annual average concentration levels of ozone detected in the chimneystacks with respect to the law limit.

EMISSION OF OZONE



EMISSION OF MINERAL OILS

Annual average concentration levels of mineral oils detected in the chimneystacks with respect to the law limit.

5.2 WATER

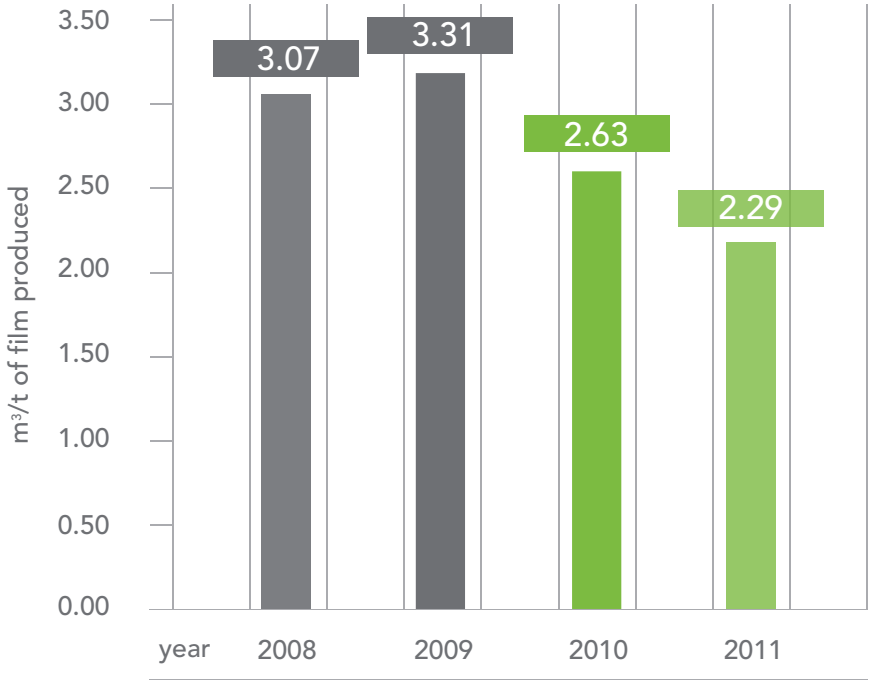
Water is intended both in terms of natural resource consumed and wastewater that derives from the process and is costantly monitored. In the San Giorgio di Nogaro plant, it is used only as a thermal fluid during the cooling and stabilizing phases of the film, therefore there are no relevant polluting substances. Rainwater that flows on roofings and squares of the plant has been monitored too.

The water process cycle is of closed type, therefore consumption rates are limited to the vapour derived from the evaporative towers, water overflows and the periodical discharge necessary to maintain the appropriate characteristics of the fluid in the cooling circuit. Below there are the details of waste water produced:

- overflow of production plants (extrusion lines and regeneration plants)
- discharge of the evaporative towers
- washing of sand filters
- additional operations (i.e. washings using water cleaners)
- toilet facilities
- canteen

Water consumption rates are nearly 2 or 3 m^3 per ton of film produced with a trend that has registered a significant reduction during the last three years, stabilizing at 2.29 m^3 per ton of film in 2011.

WATER CONSUMPTION



Water consumption indicator according to the production.

After 2009 a new cooling plant aided the further reduction of water consumption. (See section 6).

PARAMETERS	LIMITS (mg/l)	VALUES			
		2008	2009	2010	2011
BOD at 20°C (mg O_2/l)	≤250.00	<10.00	10.00	10.00	15.00
Total Suspended Solids	≤200.00	12.00	<10.00	<10.00	<10.00
COD (as O_2) mg O_2/l	≤500.00	<10.00	34.00	18.00	34.00
Iron	≤4.00	0.60	<0.20	0.40	<0.20
Zinc	≤1.00	0.13	0.16	0.13	0.02
Copper	≤0.40	0.04	0.06	0.02	<0.01
Aluminium	≤2.00	<0.05	0.05	<0.05	<0.05
Ammoniacal nitrogen	≤30.00	<1.00	1.00	1.00	1.00
Nitric nitrogen	≤30.00	<1.00	1.00	1.00	2.00
Nitrous nitrogen	≤0.60	0.08	0.30	0.12	0.10
Total surfactants	≤4.00	<0.40	0.40	0.40	<0.40
Total hydrocarbons	≤10.00	<0.50	<0.50	<0.50	<0.10

Concentration rates, expressed in mg/l, are detected in wastewater of the main parameters compared to the relative law limit.

The concentration rates detected in wastewater are far lower than the limit established by law, with levels always below 10% of the limits.

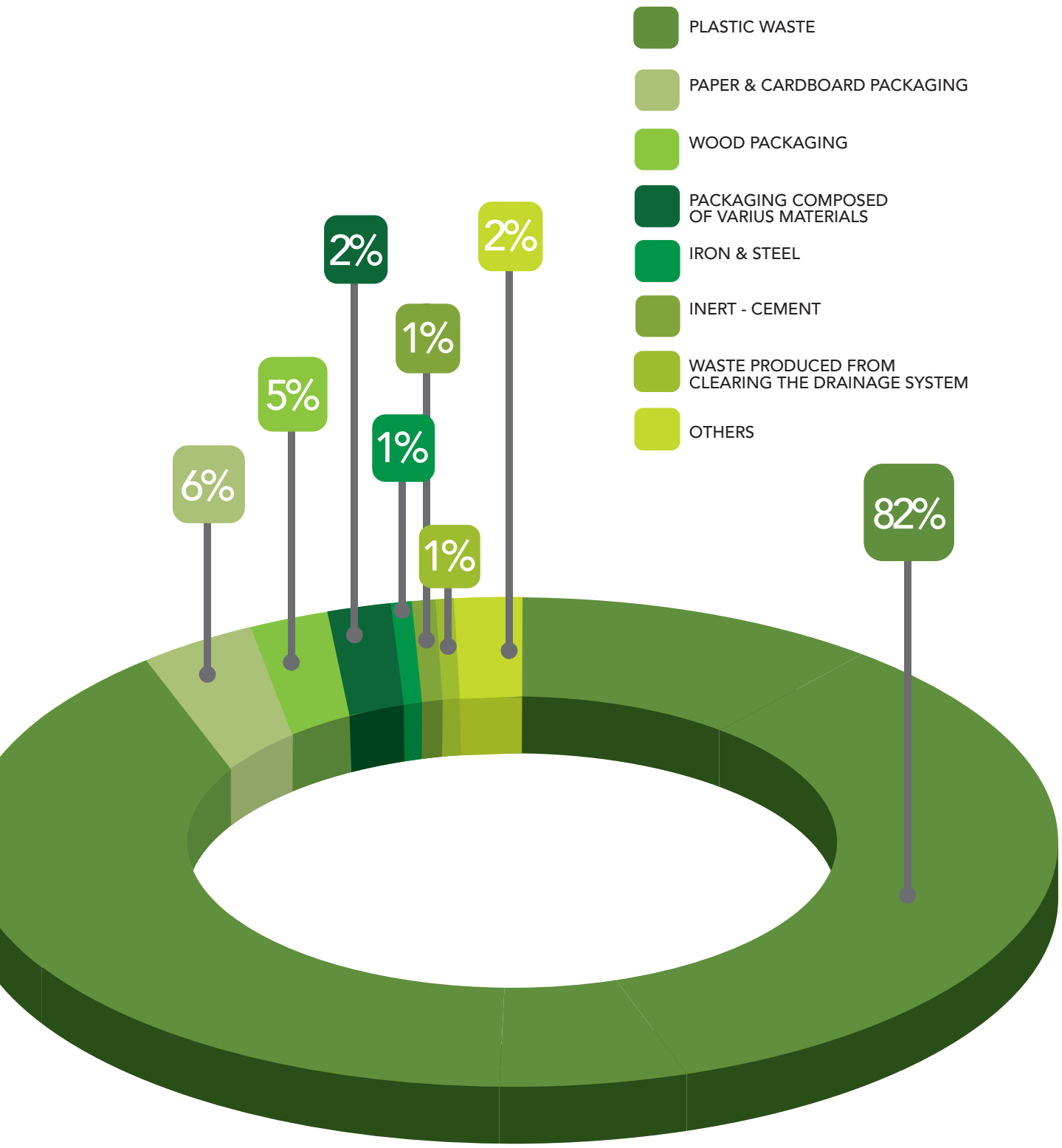
Below are listed the average rates of the main parameters analysed in three points of rainwater discharge.

PARAMETERS	LIMITS (mg/l)	VALUES			
		2008	2009	2010	2011
Suspended materials	≤80.00	4.80	9.00	4.70	13.30
BOD 5	≤40.00	9.50	10.80	10.70	N.R
COD	≤160.00	37.70	31.90	25.70	23.70
Total surfactants	≤2.00	0.70	0.60	0.40	0.30
Total hydrocarbons	≤5.00	2.90	1.90	2.40	N.R
Test of acute toxicity	≤50.00	/	/	3.30%	6.70%

Average concentration rates, detected in wastewater drainage derived from the main parameter, in comparison with the law limit references. Data is expressed in mg/l - n.r. = not revealed.

5.3 WASTE

Waste produced is mainly composed of waste products and scraps derived from manufacturing, followed by lower amounts of packaging and other types of waste, as per the following pie chart regarding 2011 on a total of 4,140,045 kg produced.



Percentage sharing of the main types of waste produced in 2011.

The amount of hazardous waste produced is 1% of the total amount of waste.

WASTE DERIVED FROM THE MANUFACTURING PROCESS

Taghleef Industries has always been involved in specific activities to optimize its production processes with the aim to reduce and rationalize the use of raw materials. These activities have positively impacted the reduction of scraps and the possibility to reuse them.

A high attention to the product quality does not allow the recovery of all the production scraps and their subsequent regeneration. The amount left is recycled by specialized companies in order to use it as a less valuable secondary raw material and therefore not suitable for food contact.

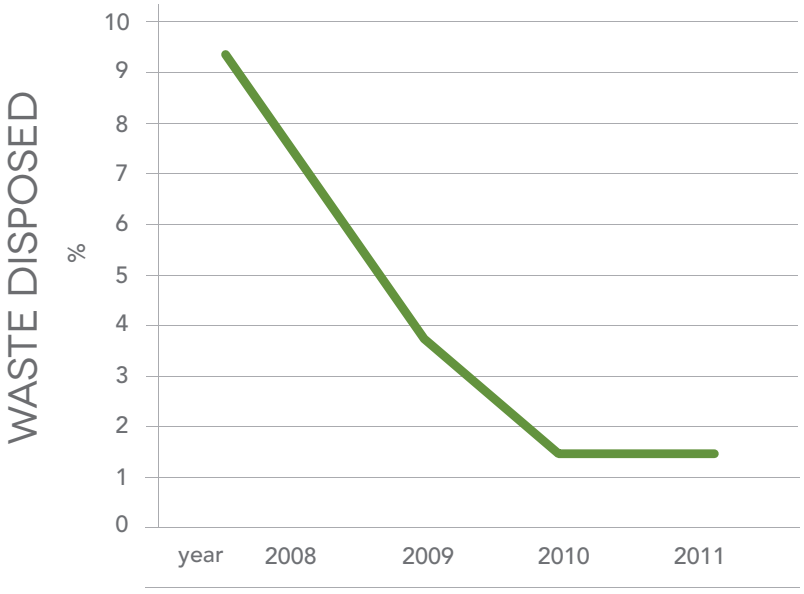
The following raw materials are currently recovered using internal regeneration plants:

Polypropylene homopolymer

Polypropylene from white films

Polypropylene from white voided films

Even though polypropylene waste products that are not reclaimed by Taghleef Industries S.p.A. are characterized by a high request and a specific market value, they are in any case managed as waste with the aim to guarantee the highest respect of law prescriptions.
Most of the waste produced by Taghleef Industries S.p.A. is subject to a recovery process and the percentage of waste disposed has been reduced during the years, stabilizing at nearly 1.5% of the total amount of waste produced in 2011.



Percentage of waste disposed compared to the total production of waste

Other types of waste

The graphics below shows the progress of the most significant types of waste in terms of annual production.

The increase of packaging waste produced since 2010 is due to the introduction of new types of raw materials that are delivered in special packages (octabins).

PAPER AND CARDBOARD PACKAGING

Paper and cardboard packaging production trend depending on the annual film production.

WOOD PACKAGING

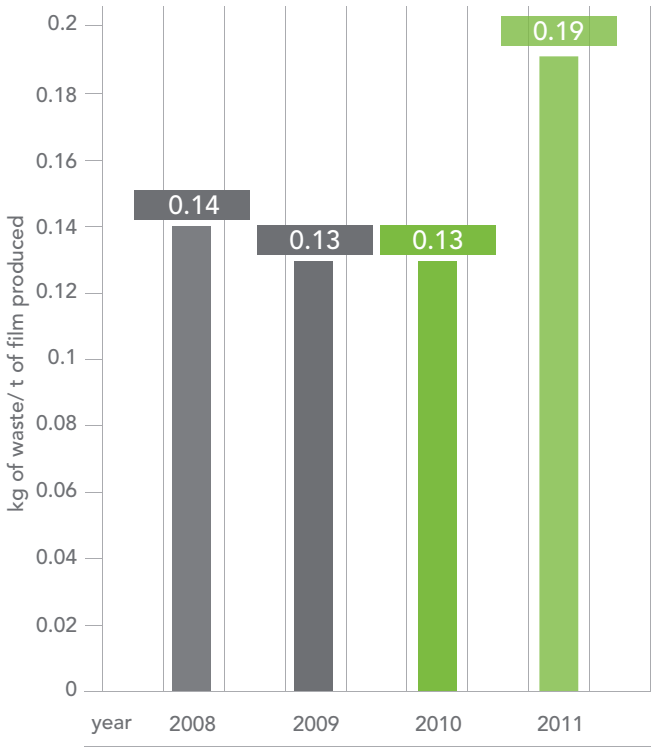
Wood packaging waste production trend depending on the annual film production.

In addition to what is stated in general terms for all types of packaging, the strong increase in waste production derived from wood packaging and detected after 2010, is due to an increase in quantities of semi-finished products coming from the plants located in MENA (Middle East and North Africa) countries and an increase in quantities of wood pallets and sideboards collected by customers.

PACKAGING COMPOSED OF VARIOUS MATERIALS

Production trend of packaging waste composed of various materials depending on the annual film

OIL WASTE



The yearly fluctuation of waste oil produced is mainly influenced by the poliannual maintainance activities

5.4 ENERGY

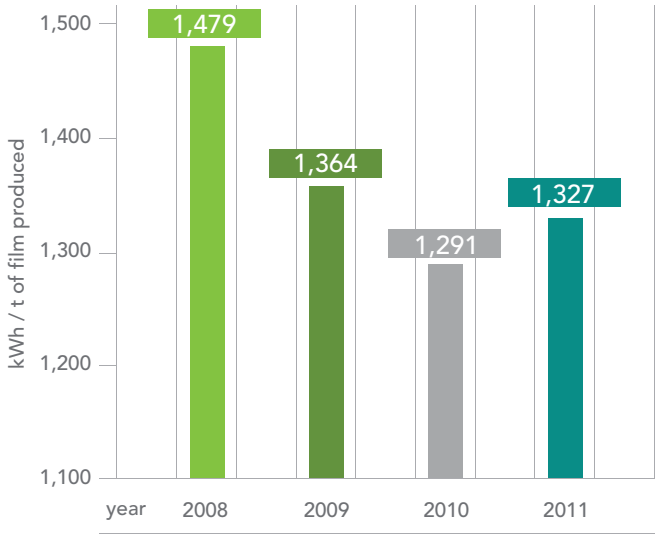
Taghleef Industries S.p.A. manufacturing processes consume electric and thermal energy produced from methane combustion. For some years now an accurate measurement system for electric energy consumption has been installed in order to have a detailed monitoring and management of the energy consumption by tons of film produced.

ELECTRIC ENERGY

Electric energy is used in all processes, from the fusion of raw materials, at nearly 250°C where it is necessary to assure workability of the material, to the motorized devices used to transport and manufacture the products. Part of the electricity consumption is caused by the utilities necessary to the process, mainly refrigerated water and compressed air.

Electricity consumption per 1 t of film produced.

ELETRICITY CONSUMPTION



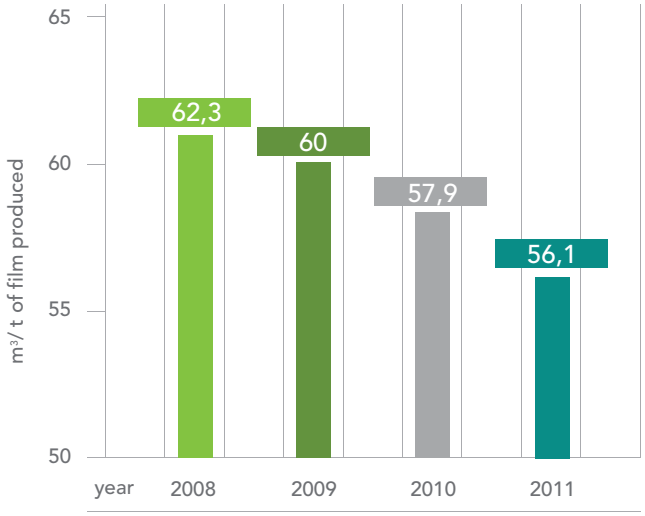
In 2009 a new cooling plant
was installed (see Section 6) allowing the company to obtain a **significant reduction of energy consumption.**

GAS

Gas is used for direct and indirect heating of the plastic film during preheating stages before longitudinal and transversal stretching. It is equally necessary for the surface treatment of the film to prepare it to the following printing phases.

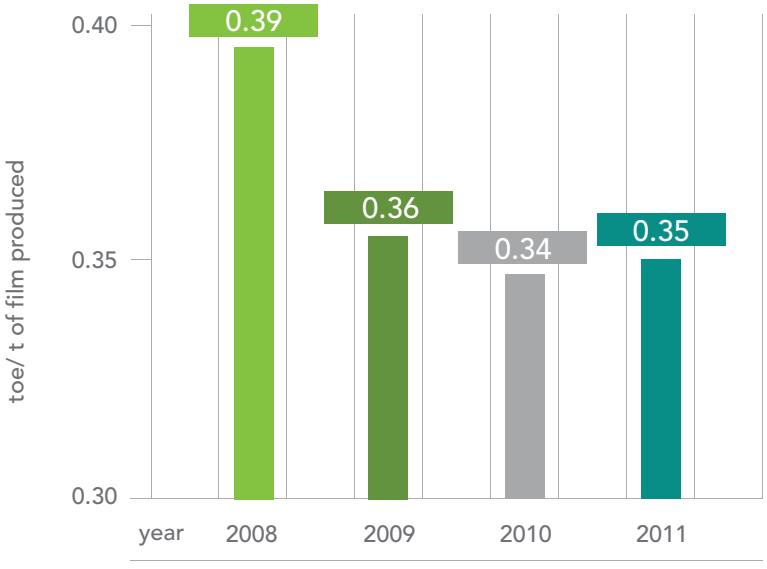
Gas consumption per t of film produced.

GAS CONSUMPTION



Differences in gas consumption rates are due mainly to the variations of the product mix requested by the customers, characterized by different requirements in terms of unit gas consumption for their production.
In addition, planned plant maintenance in 2011 helped reduce the consumption as well.
The following graphic summarizes the total energy consumption rates expressed in tonne of oil equivalent.
For electricity, 1 MWh corresponds to 0.23 toe and for gas, 1000 Nm^3 correspond to 0.825 toe

TOTAL CONSUMPTION RATES EXPRESSED IN TOE



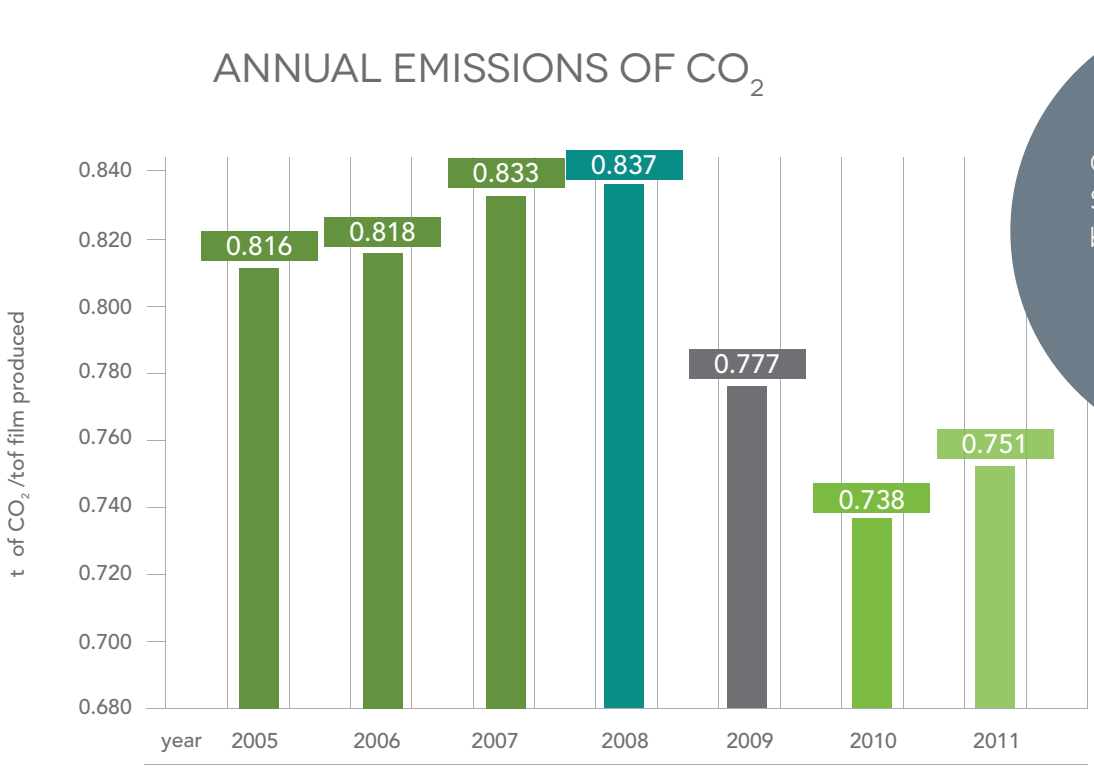
Energy consumption rates per t of film produced.

5.5 GHG EMISSIONS

Climate change has been identified as one of the principle challenges to face in the next decades and any possible solution path requires a deep involvement by everyone.
In our sector, **we play an important role along the packaging chain.** Common efforts are needed to give future generations the opportunity to live in a better world, still using safe and hygienic packaging.
Our commitment on this item includes both the organization and product level.

ORGANIZATIONAL GHG INVENTORY

We developed the **Greenhouse Gas (GHG) inventory** of the 2009 emissions, according to the international **standard ISO 14064-1**, considering all the direct and indirect energy emissions.
For this report data was calculated from 2005, in order to **be aligned** with the **EU emission reduction timescale commitment.**



GHG emissions related to Scope 1 and 2, as defined by the GHG protocol

As consequence of the **important investment** made on the cooling system in **2009** (see Section 6) a **significant GHG reduction was obtained**.

CARBON FOOTPRINT OF PRODUCT

In 2010 we progressively extended our climate awareness by developing the **Carbon Footprint of Product (CFP)** to all our products. This assessment is based on the LCA methodology and has been applied in a **cradle to gate** approach, in order to produce figures that are useful for our **client needs.**

The following table shows the global "cradle to gate" **CFP value per kg of product** and the splitted values for raw materials, transport and production are included.

PRODUCT	RAW MATERIALS	TRANSPORT	PRODUCTION	TOTAL
BOPP transparent	1.94	0.63	0.87	3.44
BOPP metallised transparent	2.02	0.65	1.20	3.87
BOPP white voided	1.82	0.62	0.94	3.38
BOPLA transparent	1.35	0.75	0.84	2.94

CFP rates of the films produced in the plant of San Giorgio di Nogaro. Data is expressed in kg of CO_2e/kg of film produced.

5.6 PRODUCTS RELATED ASPECTS

Thin film, low density and multilayer technologies provide opportunities for packaging weight reduction.

With a **density of 0.91 g/cm³**, polypropylene is among the **lightest polymers available in the market**. This advantage, in combination with the low thickness achieved through biaxial orientation technology, has been the key to success of BoPP films in recent years. However, there is still room for improvement. If we look at packaging films, further benefits can be achieved in three directions, where Taghleef Industries has always been involved:

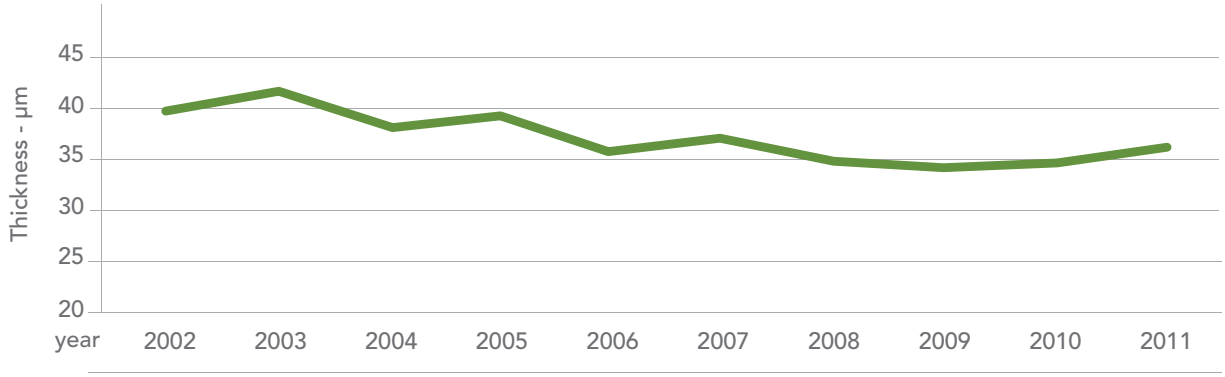
THICKNESS REDUCTION

Typical thickness for BoPP films is in the range of **30µm. Thinner films**, up to **15µm**, are available for most specifications (transparent and metallised in particular) and offer plenty of opportunities for packaging weight reduction without compromising on performance.

In cooperation with **several top brands**, Taghleef Industries S.p.A. has demonstrated that **reducing the thickness** of the package without compromising performance (appeal, runnability, shelf life) is indeed possible. The table below, outlining the average thickness of a white voided film typically used

in **ice cream** and confectionery packaging, confirms that the average thickness has been reduced in 10 years by more than 10%, **moving from 40 µm to 35 µm**. Another recent example is the thickness reduction implemented in the potato chips bags, where several brand owners are moving from 20+20 microns to 15+15 microns clear – metallised laminates, especially for the smaller packs.

ELD FILM AVERAGE THICKNESS



Average thickness trend of ELD film from 2002 to 2011

DENSITY REDUCTION

In BoPP terms, **reducing the density means replacing plastic with air.** This is possible thanks to the cavitation technology, which created vacuoles within the film. The final result is a white pearl-kind of effect. These low-density cavitated BoPP films are commonly used for confectionery, ice cream, bakery and labels. In the early stages, the **typical density** was in the range of **0.75 g/cm³**. Thanks to **recent developments** in masterbatches and extrusion technology, **0.62 g/cm³ density has become a standard**, and **0.55 g/cm³** is just behind the corner: **one more step in the direction of doing more with less**.

IMPROVED PERFORMANCE

A very important function of packaging is preservation of the product. When it comes to food packaging, this means providing the conditions which allow the longest shelf life. Such conditions depend largely on the kind of food we are packing: it can be moisture barrier, gas barrier, light protection, aroma barrier, seal integrity, or a mix of these: each food has its own requirements. Improving shelf life means optimizing distribution and minimizing food waste. Once again, it's all about finding the **right balance between environmental costs of packaging versus the benefits of the longer shelf life.**

The first steps taken into this direction by Taghleef Industries S.p.A. have been the development of high barrier metallised films and improved seal integrity for tight seals. More recently, Ti has invested into multilayer extrusion, to achieve clear, white and metallised heat sealable films with high gas barrier for modified atmosphere packaging. This innovative range of film, named EXTENDO™, allows Ti's customers to replace thick laminates with monowebs, and create fully-recyclable monomaterial structures.

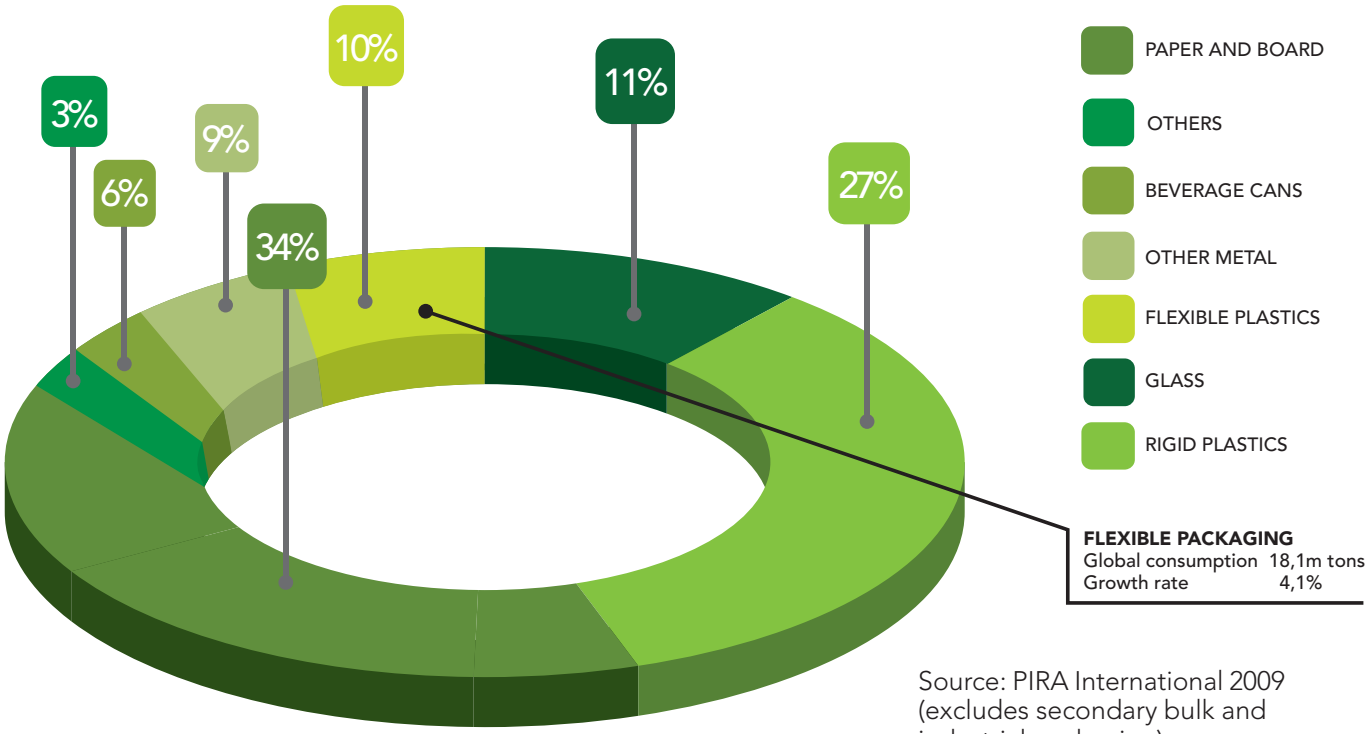
NATÍVIA™ BIO-BASED FILMS

MAKING PACKAGING MORE SUSTAINABLE

Flexible packaging has proven to be a great solution because it brings several advantages compared to rigids: lightweight, transport efficiency, packaging performance among many.

As of today, **flexible packaging** represents **10% in weight of total consumer packaging**, with a growth rate of more than 4%. However, there is one aspect where flexible packaging is well behind many rigid packaging solutions like glass, rigid plastics or metal: recyclability.

Lightweight, multilayer laminates and contamination make recycling flexible packaging technically and commercially difficult. This means that most of it is either incinerated or, in the worst case, landfilled.



Source: PIRA International 2009 (excludes secondary bulk and industrial packaging)

The whole **flexible packaging industry** is looking in various directions at solutions **to improve the recycling rate,** but progress is still very slow.

One of the directions is leading to **compostable materials**, which offer the opportunity of an organic recycling process (composting) as additional end of life option.
NATÍVIA™ PLA film can provide several environmental advantages:

It's made from renewable resources

Its low thickness, mechanical and sealing properties provide good weight/performance ratio

It can be mechanically, chemically as well as organically recycled

6. ENVIRONMENTAL IMPROVEMENT

6.1 TARGETS ALREADY ACHIEVED

Below there is a list of some **important targets achieved** during the past years to reduce environmental impacts mainly related to energy and water consumption rates.

2006

- A new well was drilled in order to reduce the amount of water consumption. It uses a pumping system that keeps the pressure constant until the discharge line of the plant, bypassing the water tank and allowing water conservation.
- In line E2 the electric batteries used inside the oven were substituted by diathermic oil batteries, heated by a gas burner.
- In line E3, the air batteries based on a refrigeration cycle were substituted by batteries that use refrigerated water to reduce electricity consumption.

2007

- During 2007 a new air compressors control unit has been installed to control and optimize machines loading times with a 6% reduction of electricity consumption.
- The waste film grinders of our production lines E3, E4 and E5 had previously a constant run, but most of the time without need. So we are now keeping them stopped all time and automatically activating via a film break signal. The estimated saving per year is 3,300 MWh.
- A new and highly efficiently chiller became operational in January 2009. In terms of electricity it allows to save 1MWh per 8,500hours/year.

2010

- Two transformers of 20,000/400 V were removed to rationalize the electricity distribution. Another transformer was removed in 2011.

6.2 FUTURE TARGETS

Below there is a list of the short and medium term objectives defined by Taghleef Industries S.p.A. in accordance with the 2020 environmental strategy.

ENERGY Reduction of 2% of electricity consumption rates per tons produced - increase of the plants electric efficiency.

OBJECTIVES	DEADLINE	ECONOMIC RESOURCES
Revamping the compressed air plant and installation of two more efficient compressors.	31.12.2012	290,000 €
Installation of a more efficient chiller to produce refrigerated water.	31.12.2013	1,100,000 €
Substitution of one of the main extruders with the new twin screw technology.	31.12.2015	1,000,000 €
Installation of twenty frequency converters to control three-phase asynchronous engines with direct starter.	31.12.2015	50,000 €

Reduction of **ELECTRICITY** consumption rates - installation of led lights

OBJECTIVES	DEADLINE	ECONOMIC RESOURCES
Installation of crepuscular power relays to reduce lighting during the day in two areas of production.	31.12.2013	15,000 €
Installation of led lights in two areas of production.	31.12.2014	75,000 €

Reduction of **WATER** consumption - elimination of water consumption used to backwash filters

OBJECTIVES	DEADLINE	ECONOMIC RESOURCES
Substitution of sand filters with centrifugal filters.	31.12.2013	80,000 €

7 CERTIFICATIONS

Taghleef Industries' Quality Management System (QMS) has always being focused on providing the **packaging industry with outstanding products and services that comply with international standards.**

In order to pursue this objective and ensure continuous improvement, the company began to perform internal audits in 1995. All the certifications received were approved by a Worldwide recognized Certification body: "Det Norske Veritas" (DNV).

Following this path, Taghleef Industries demonstrates its ability to manufacture a product that complies with statutory and regulatory requirements and is conform to all the applicable National and International laws.

CERTIFICATIONS OF THE MANAGEMENT SYSTEMS	*Ti* S.p.A.
ISO 9001:2008	Since 1995
HACCP Method	Since 2000*
ISO 14001:2004	Since 2000
BRC/IoP Standard	Since 2004
BS OHSAS 18001:2007	Since 2005
GHG inventory (ISO 14064-1)	Since 2010
Italian Legislative Decree No. 231/2001	Since 2011
LCA/CFP of BOPP & BOPLA films	Since 2011
Environmental report	Since 2012

* subsequently integrated in BRC/IoP standard

8. GLOSSARY

BIOCHEMICAL OXYGEN DEMAND 5 (BOD5)

Biochemical oxygen demand refers to the amount of dissolved oxygen consumed in 5 days by aerobic biological organisms in a body of water in order to break down organic material present in a given water sample at a certain temperature.

BRC/IOP STANDARD

BRC/IoP Standard refers to the Hygiene Management System. It has been defined after extensive consultations between the British Retail Consortium (BRC), the Institute of Packaging (IoP), packaging suppliers, food manufacturers and third party certification bodies. It includes binding standards for suppliers of food packaging materials for primary food packaging.

BS OHSAS 18001:2007

It is a British Standard for Occupational Health and Safety Management systems. Its aim is to help all kinds of organizations to put in place demonstrably sound occupational health and safety performance.

CARBON FOOTPRINT OF A PRODUCT (CFP)

It is the sum of greenhouse gas emissions directly and indirectly related to the entire life cycle of a product.
It is based on a LCA methodology and it is normally expressed as quantity of CO_2 equivalent.

CHEMICAL OXYGEN DEMAND (COD)

Chemical Oxygen Demand is the standard method for indirect measurement of the amount of pollution (that cannot be oxidized biologically) in a sample of water. It follows a procedure based on the chemical decomposition of organic and inorganic contaminants, dissolved or suspended in water. The resulting data indicate the amount of water-dissolved oxygen (expressed as parts per million or milligrams per liter of water) consumed by the contaminants, during two hours of decomposition from a solution of boiling potassium dichromate. The higher the chemical oxygen demand, the higher the amount of pollution in the test sample.

GREENHOUSE GASES (GHG)

Greenhouse gases, of both natural and anthropogenic origin, are part of the atmosphere and their increasing concentration is responsible for the anthropogenic climate change. The GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydro fluorocarbons (HFC - a class of several gases), per-fluorocarbons (PFC - a class of several gases) and sulphur hexafluoride (SF_6).

ISO 9001:2008

ISO 9001:2008 sets out the criteria for a quality management system and is the only standard in the family that can be verified through internal audits. Following this procedure, an organization checks how its quality management system is working and may decide to invite an independent third part

body to certify that it is in conformity to the standard.

ISO 14001:2004

ISO 14001:2004 specifies the requirements for an environmental management system to enable an organization to develop and implement a policy and objectives which take into account legal requirements and other requirements to which the organization subscribes, and information about significant environmental aspects. It applies to those environmental aspects that the organization identifies as those which it can control and those which it can influence. It does not itself state specific environmental performance criteria. As ISO 9001:2008 it may be certified by an independent third party.

LIFE CYCLE ASSESSMENT (LCA)

Life Cycle Assessment is an examination of the environmental performance of products and services throughout all phases of their lifecycle: from the extraction of raw materials, to manufacturing, transportation and distribution phases, carrying on with use, re-use, maintenances stages and finally focussing on recycling and disposal.
The methodology is based on the ISO 14040 series. Even if it analyses several phases, it usually does not include social impacts.

ITALIAN LEGISLATIVE DECREE NO. 231/2001

The Italian Legislative Decree No.231/2001 issued on the 8th of June 2008 has introduced the discipline of the administrative responsibility of the firms on the basis of which these can be retained responsible, and consequently sanctioned, in relation to some offences committed or attempted in the interest or to the advantage of the firm, of the administrators or the employees. The responsibility of the Firm is excluded if it has adopted and efficiently actuated, before the commitment of the offence, organization, management and control models suitable to prevent these offences and has instituted an Organism to control the functioning and the observance of the models.

HAZARD ANALYSIS AND CRITICAL CONTROL POINTS METHOD (HACCP METHOD)

The Hazard Analysis and Critical Control Points System identifies, evaluates and controls hazards which might result in consumers receiving harmful food products.

TOTAL SUSPENDED SOLIDS

Total suspended solids are small particles of solid pollutants that float on the surface of, or are suspended in, sewage or other liquids. They resist removal by conventional means.

TONNE (S) OF OIL EQUIVALENT (TOE)

Tonne(s) of oil equivalent is a normalized unit of energy. By convention it is equivalent to the approximate amount of energy that can be extracted from one tonne of crude oil. It is a standardized unit, assigned a net calorific value of 41 868 kilojoules/kg and may be used to compare the energy from different sources.

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