Going Strong

Corporate Social Responsibility Report 2009
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Dear reader,

The theme for last year’s CSR report, ‘Strength in Unity’, could not have been more apt. What it meant for Teijin Aramid became evident in the crisis year of 2009. We needed to take a number of radical measures to get through the crisis. More than ever, we managed by expense, reduced the number of employees, and cut costs on all fronts. We focused on short-term Research & Development projects. Our people were asked to be extra thrifty and to make sacrifices.

What we did not do was to panic. We know the value of aramid for the world and know what is the potential for our high performance fibers. Happily, we were able to keep our human capital onboard and to have everyone’s cooperation in every measure we took. The sense that we wanted to survive this crisis together was strong among all. We were strong and want to continue strong.

The months of November 2008 to May 2009 marked the bottom of the crisis for us. In the following months we saw, happily, the first tentative signs of recovery. We attribute this primarily to our customers using up their inventories. During the summer months demand did not drop any further, and from then on the market steadily recovered throughout the rest of the year. As this is being written, we have not yet fully achieved our intended level. In addition, the number of our customers’ development projects has slowed. It will take some time before the rapid growth of recent years returns. But we have every confidence that it will.

Teijin Aramid’s Corporate Social Responsibility policy was carried out in 2009 according to plan. The right balance among people, planet, and profit continues to be our focus, even in times of crisis. In addition, the crisis gave us new insights in the CSR area. We took the Eco-Efficiency Analysis to heart in 2009 and a number of pilots are underway at this time. We describe this in the report. Our ultimate goal is to make Eco-Efficiency analyses a regular element of the marketing mix. It will also be used in determining the Research & Development portfolio. This will make CSR more clearly a part of our operations and it will make the impact of our efforts on the environment and our profits much more evident for our customers and for us.

We expect Corporate Social Responsibility to become an even stronger element of our daily operations in the coming years. This crisis made it clear to us that the balance between short-term profit and sustainability is clearly in favor of the latter and that embedding CSR in our company’s DNA can lead to long-term profit, together with our customers and our personnel. This is how we all will keep on going strong, even in difficult times.

I wish you pleasant reading.

Gert Frederiks
CEO and President Teijin Aramid
June 2010
About this report

How this report was created
This report is intended to inform our stakeholders in a transparent way about our efforts in the area of Corporate Social Responsibility (CSR). Our direct and indirect stakeholders include employees, customers, suppliers, neighbors and nearby companies, governments, non-governmental organizations (NGOs), unions, industry associations, banks, and (other units of) Teijin Ltd. This is our seventh CSR report, something we are proud of. We are also quite proud that this report has been written entirely by our own people. This was accomplished in a difficult year, one in which we had to give all our attention to avoiding red ink and remaining within the credit limits set by Teijin Ltd. and our banks. Despite all these conditions, we did not relax our grip in the area of CSR. We are proud to present this report of our work.

Selection of material issues
We selected the topics for this report with the input of both internal and external stakeholders. For last year’s report we engaged in dialogue with a few stakeholders in order to evaluate our choice of material issues. Material issues are those topics which the organization views as highly important for its operations and about which the stakeholders would like to be informed or enter into dialogue.

For this report, employees, customers, NGOs, service providers, and parties from the chemicals sector ranked the importance of the issues at play within our sector and our company. We find, for instance, that patents have a very high impact on operations, but our stakeholders indicated they have little interest in information on these.

The results of the 2009 Transparency benchmark showed that Teijin Aramid scored high in the area of such social aspects as ethics and integrity. We will certainly highlight these in this report. Other topics raised by our stakeholders included our environmental management systems, employee training, and our memberships.

Reporting guidelines
As in the previous year, we used the Global Reporting Initiative (GRI) guidelines for this report. Based on a self-assessment, this report meets the requirements for the GRI B-level. Annex 4 provides a summary of the elements covered. In addition to the GRI guidelines, we follow the International Financial Reporting Standards (IFRS) and J-SOX, the Japanese counterpart to the American Sarbanes-Oxley Act, in our financial reporting. Our environmental management systems and a new HR information system (IHRIS) provide us with the non-financial data included in this report. We have used 2005 as the base year for the description of development in the past years.

We worked with KPMG Sustainability BV for the CSR reports for the years 2005 through 2007. The report for 2007 was subjected to test verification in preparation for external verification. Due to the economic situation we have decided, as we did in 2008, not to subject this report to outside verification.

Scope
This report covers Teijin Aramid’s entire international organization. The examples used are oriented chiefly on the Netherlands.
CSR-ups and downs in 2009

**Ups**

- An Eco-Efficiency Analysis pilot was completed; its results are highly promising.

- An "energy day" was held to kick off the coordination of Teijin Aramid-wide energy savings activities. The activities follow the signing of the MJA-3 (multiyear agreement with the Dutch government).

- The Delfzijl production site had to shut down the line temporarily. Despite the resulting decreased efficiency, the site was able to achieve a year-over-year reduction in water consumption per ton of product.

- Our core values (PURE: Passion, Unity, Respect, Excellence) were introduced among the leadership team, the management layer immediately below the management team.

- The Dutch Japanese Trade Federation (Dujat) presented us with the Deshima award in appreciation for our role in Dutch community and the economy.

- An idea from an employee received the highest reward ever made. This idea concerning an assembly comb has made work on the spinning line safer and especially considerably more efficient.

- We achieved a decrease of 28% in the number of business kilometers traveled, with a direct effect on CO₂ emissions.

- We achieved a structural reduction in the amount of polymer waste.

**Downs**

- In order to retain our permanent employees we had to let go of nearly our entire flexible workforce.

- We had to ask our employees to take their free days and forego a general wage increase.

- Our energy efficiency decreased at all production sites by comparison with 2008, a deterioration due to low production capacity in response to the economic crisis.

- Health-related absences rose from 4.4% in 2008 to 5.2% in 2009.

- Incidents resulted in an increase of polymer emissions into the air in Delfzijl and of Freon in Emmen.
## CSR achievements and ambitions

The table below lists and explains our CSR achievements and ambitions. This overview gives a synopsis of what is covered in greater detail in the chapters to follow.

<table>
<thead>
<tr>
<th>What did we promise for 2009?</th>
<th>What did we achieve?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stakeholder engagement</strong></td>
<td>We held seven separate meetings with various groups of stakeholders and one collective meeting; at the Delfzijl production site we met with such stakeholders as neighbors, the municipality, the Ministry of Waterways and Public Works, and the Province.</td>
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<tr>
<td>To make a start in 2009 with stakeholder meetings (four in the context of the CSR report) and a doubling of this number in 2010.</td>
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<tr>
<td><strong>Ethics &amp; Integrity (E&amp;I)</strong></td>
<td>Core values and a code of conduct are part of PURE (see chapter 1). PURE was introduced in the leadership team. A confidant was named for our locations outside Europe.</td>
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<tr>
<td>E&amp;I aspects are part of our core values. An independent confidant will be appointed in 2009 for the USA, Brazil, and Shanghai.</td>
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<tr>
<td><strong>Health-related absences</strong></td>
<td>The percentage of health-related absences in 2009 was 5.2%. Our permanent production personnel's workload increased due to the reduction of the flextime workers in response to the crisis.</td>
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<tr>
<td>We are working toward further reduction in the percentage of health-related absences. In 2008 we achieved a percentage of health-related absences of 4.4%.</td>
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<tr>
<td><strong>Energy efficiency</strong></td>
<td>The efficiency of our plants deteriorated significantly due to large output reductions. Our energy efficiency for 2009 is 7% below base year 2005.</td>
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<tr>
<td>We will push for a 2% increase in energy efficiency each year until 2020, measured against index year 2005.</td>
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<tr>
<td><strong>CO₂ emissions</strong></td>
<td>We achieved absolute indexed CO₂ emissions of 90 versus base year 2005.</td>
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<tr>
<td>We are pushing for a 2% drop in CO₂ emissions each year until 2020.</td>
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<tr>
<td><strong>NOx emissions</strong></td>
<td>We achieved absolute indexed NOx emissions of 30 versus base year 2005.</td>
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<tr>
<td>We do not believe that eliminating NOx emissions entirely is a realistic goal. Instead, our goal is to reduce emissions by at least 80% v. 2005 by 2020.</td>
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<tr>
<td><strong>Recycling</strong></td>
<td>We have recycled 4% of our total output. 30% of our products are potentially recyclable. We are recycling a good 15% of this group.</td>
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<tr>
<td>New CSR item in this summary.</td>
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<tr>
<td><strong>Eco-Efficiency Analysis (EEA)</strong></td>
<td>The pilot was completed successfully. We created scope for follow-up studies through intensive communication. This has been prioritized.</td>
</tr>
<tr>
<td>The EEA-pilot will be completed. If successful, we hope to have an EEA for each large capital expenditure (&gt; €5 million) starting in 2010. We would also like to conduct an EEA for a number of existing processes and products.</td>
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<tr>
<td><strong>Project navigator, including the QHSE navigator</strong></td>
<td>The project navigator is ready. Approximately 100 people were trained in its use by the close of 2009.</td>
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<tr>
<td>We would like to have the project navigator ready in 2009 and fully implemented in 2010.</td>
<td></td>
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<tr>
<td><strong>REACH (European Regulation on the Registration, Evaluation and Authorization of Chemicals)</strong></td>
<td>We are active in two consortia, taking a leadership role in the PPD consortium. We also collaborated with other producers to register some by-products on time.</td>
</tr>
<tr>
<td>We want to have completed all the activities related to the REACH registration targets by the proposed deadline.</td>
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</tbody>
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What will we do?

Increase stakeholder dialogue, and particularly with our customers.

Further rollout of PURE in the organization in the coming years. Our new code of conduct will appear in 2011.

We are working on the further automation and use of robots at our production sites, particularly in Emmen. The expansion of our flexible team will reduce the load on our personnel.

Through higher production levels and efficiency improvement programs, the plants will return to our previously achieved ambition level (2% per year v. 2005).

We want to establish a baseline for our carbon footprint in 2010. We will use scope two of the greenhouse gas protocol, complemented with a section of scope three. Scope three covers emissions of the entire chain in which we are active. Based on that, we want to define a goal for 2020.

We will continue the current approach and expect to achieve our ambitions for this item.

In 2012 we wish to recycle 25% of potentially recyclable products.

We will start new EEA studies in 2010 for gloves, recycling pulp and plastic pipes in the oil industry.

In 2010 the project navigator will be combined with questions on the EEA. The supply chain concept will be an integral part of the project navigator.

We must register our monomers PPD and TDC, a few by-products and solvents before December 1, 2010.
1. Organization and management
**Strong foundation and streamlined structure**

*Teijin Aramid's mission is to be global market leader of the high performance fiber industry. To that end we are led by our strategic goals even if the crisis in 2009 reduced our rate of growth. We continue to work on sustainable operations and on better and new products. The foundation for this is formed by our four core values: Passion, Unity, Respect, and Excellence (PURE), which apply to the entire organization.*

**Origin**

AKZO developed the first para-aramid in 1972. This was named Fiber X and would later become known as Arenka®. After a period of testing and test production the project was stopped. Its commercialization was delayed for many years because of the first oil crisis. The decision for commercial production with the financial support of the Netherlands Ministry of Economic Affairs was taken in 1982. Construction of the factories in Delfzijl and Emmen was completed in 1985.

**Better prospects**

The new fiber was renamed Twaron® in 1984 and the prospects for the product were better than ever. Production in the new plants in Delfzijl and Emmen began in 1986, with the first bobbin, made with raw materials from Delfzijl, coming off the line in May. One year later, Twaron was launched on the market. Capacity was expanded in 1994, while in the meantime organizational change continued. In 1999, Akzo Nobel placed its fiber activities into a separate legal entity (Acordis), which was sold in early 2000 to a British investment company.

**A new millennium**

Teijin Ltd took over the Twaron activities end of 2000. This marked the start of successful investments and expansions. In 2007 Teijin Twaron was renamed Teijin Aramid. Teijin Aramid has a sales organization that sells four different aramid brands around the world, of which Twaron has the largest share.

**Our products**

Our Twaron®, Sulfron®, Teijinconex®, or Technora® is present where strength, durability, safety, heat resistance or low weight is needed. Our products can be found globally in many different markets such as the automobile industry, ballistic protection, shipping industry, civil engineering, telecom, energy, and oil & gas.

**Sources**

Teijin Aramid produces Twaron and Sulfron in the Netherlands; Technora and Teijinconex are produced in Japan.

Twaron is a very strong, light para-aramid fiber (poly-paraphenylene terephthalamide), developed and produced exclusively by Teijin Aramid. The fiber has a high modulus, is thermally stable, and is highly resistant to shocks and chemicals. Since Twaron’s development in the 1970s, Teijin Aramid has produced the monomers and polymers in Delfzijl and the yarn in Emmen. Twaron is used in an enormous range of specialized applications and is modified to meet our customers’ product requirements. Twaron is widely viewed as a high quality sustainable product with high recycling potential.

Sulfron is made by impregnating short Twaron fibers with special chemicals. It ensures that automobile tires wear less, have lower rolling resistance, and therefore have a longer useful life and lower fuel consumption in comparable applications.

Technora is an aramid co-polymer that is very strong, resistant to the effects of heat and chemicals, and is particularly suited for intensive use and applications subject to a great deal of movement. It is often used to strengthen rubber, cement, and plastic, but also for cables and protective products.

Teijinconex is especially heat-resistant while being soft and lightweight. It does not ignite, does not melt, and does not stick to the skin. It is a super-comfortable meta-aramid fiber often used in heat-resistant clothing and in all sorts of high temperature filtration applications.

“Wonderful that we arrived at our PURE core values together! It is still hard to explain to others why core values are so important. This is all about behavior, of course, and how we want to deal with each other to achieve our strategy. It is now important simply to show, to talk about, and to be responsible for your own conduct. In short: show exemplary conduct and make sure it becomes common practice for everyone!”

Edward Groen, site manager Emmen
Strategy
Our strategy is aimed at achieving sustainable and profitable business activities, ambitious growth, and further globalization. We wish to satisfy the requirements of customers in all market segments by implementing a two-part approach. We serve the market both with high quality products developed in close consultation with the customer and with more standard types able to compete well on price in competitive market segments through economies of scale. We want to operate in new markets and work with the customer on new applications. Our ambition is also to develop sustainable products, processes, and methods proactively. We want to achieve this by the continued development of our personnel through empowerment whereby shared values and diversity are central.

This strategy is linked to Teijin Ltd.’s business philosophy: Enhancing the quality of life, In harmony with society, and, Empowering our people.

Core Values
Passion, Unity, Respect and Excellence: these are Teijin Aramid’s core values. These are the foundation for our organization and represent who we are and how we wish to be seen by others. They are our guides for the realization of our strategy. Where our strategic goals determine WHAT we wish to achieve, these values describe HOW we do this. Each value tells its own story, but at the same time is inextricable from the other three. Together, these are what we want our customers and other stakeholders to experience in every contact we have with them. The four values strengthen our reputation, distinguish us from competitors, and bond us with our customers.

Translation into a code of conduct
In 2008 the management team and the leadership team jointly established Teijin Aramid’s values. These apply to all employees of Teijin Aramid anywhere in the world. The values must be applied at every level, to every action, and to every transaction so that we do internally what we promise externally. That demands a great deal of attention from all personnel, but it starts with the good exemplary conduct of management. Values become valuable only when our conduct follows them. We therefore continue to work on making the desired conduct more visible. In the past year we took this step: each value was translated into three principles of conduct in several sessions with the management team and the leadership team.

Passion
We are proud of our organization, our product, and our work.
We do our best with pleasure and enthusiasm for our customer.
We set ambitious goals.

Unity
We work as a team in the interest of the entire organization.
We share experience and help others to solve problems.
We feel connected with each other and with the organization’s values and strategy.

Respect
We approach people in a positive and constructive manner.
We communicate clearly and transparently.
We take account of the interests of our customers, our colleagues, the environment, and the community.

Excellence
We take initiative and show ownership.
We learn today in order to perform better tomorrow.
We invest in the development of all personnel in order to perform excellently.

“The core value Unity says ‘We work as a team in the interest of the entire organization.’ In order to achieve renewal and improvement, certainly in the area of CSR, you really need each other. PURE is just that extra push you can use with each other.”
Con van Regteren, manager research institute
Good exemplary conduct by supervisors stimulates employees to exhibit the desired conduct. That is why communication on the meaning of the values for Teijin Aramid in 2009 was nearly entirely focused on the management team and the leadership team. This has resulted in a strong awareness of the importance of values for our organization and to setting a code of conduct. We have already achieved a great deal with each other through this but more time is needed for the dissemination of the desired conduct. That is why we will concentrate in the next years on the introduction and understanding of the values among all personnel of Teijin Aramid at home and abroad.

Who, what, where
Teijin Aramid is a subsidiary of Teijin Ltd. It produces high value aramid fibers in Delfzijl, Emmen, and Arnhem. Teijin Aramid has a 50% interest in the Technical Textile Institute (TTI) in Wuppertal, Germany. At the close of 2009 we acquired full ownership of the Technical Fibers Application Institute (TFA) in Arnhem (the Kleefse Waard site).

We have global coverage through our sales offices and agents.
The raw materials for the factories in Delfzijl are brought in by truck or pipeline. This is the production site for the monomers PPD (paraphenylene diamine) and TDC (terephthaloyl dichloride), which are the building blocks for our polymer (PPTA). The solvents are recovered in a separate plant for reuse.

The polymer produced in Delfzijl provides the raw material for the spinning factory in Emmen. Here the PPTA is dissolved in concentrated sulfuric acid. The dissolved polymer is then spun into aramid yarns. The sulfuric acid is then washed out of the yarns and recovered for the most part. By adding fuming sulfuric to recycled acid we can make concentrated sulfuric acid again.

Most of the yarn is immediately sold while some is given further treatment for special applications into Twaron fiber and pulp.

There is a second factory in Arnhem for the manufacture of Twaron pulp. We also conduct experiments here with new technologies with which we can improve our products and production processes. For example, special types of pulp are produced in the jet spin plant. Our recycling plant is also in Arnhem where we recover aramid from used end products for reuse.
Developments in 2009

2009 was a turbulent year for Teijin Aramid in many respects, not only due to the crisis, but also to a change in Teijin Aramid's organizational position within Teijin Ltd. In April 2009 the High Performance Fibers division was dissolved and divided into an Aramid Fibers Business Group (AFBG) and a Carbon Fibers Business Group. The AFBG includes the following units:

- Teijin Aramid (Twaron, Sulfron);
- Teijin Techno Products (Technora and Teijinconex);
- Teijin Cordley (imitation leather);
- Teviron (special textile fibers);
- DTPJ/DTPA, a joint venture of DuPont and Teijin for meta-aramid paper.

The goal of bundling these activities in the AFBG was to enable all aramid business units to be managed as a single, globally operating organization. This will enable us to make optimum use of our strong positions in the various markets. This development also brought a change to the management of Teijin Aramid. Eiso Alberda van Ekenstein, CEO and president of Teijin Aramid until April 1, 2009, was appointed general manager of AFBG. This was a considerable honor for him to become the first Netherlander to hold such a high position within the Japanese parent organization. From that moment he reported directly to the CEO of Teijin Ltd., Mr. Shigeo Ohyagi. Gert Frederiks was appointed as successor to Eiso Alberda van Ekenstein; he had been Director of Sales & Marketing.

A start was made after the summer of 2009 with the functional integration of the aramid units into the AFBG. This was a project involving various disciplines both from the Netherlands as well as Japan. In 2010 we announced the new structure and new roles within AFBG.

Corporate Governance

Corporate governance concerns the proper management of organizations, transparency and accountability, authority and taking responsibility, and also its supervision and acting with integrity. The following describes the corporate governance tasks within Teijin Aramid.

Supervisory Board

Teijin Ltd. created a Supervisory Board (BoS) for Teijin Aramid before this was required by law under the “Two-tier Board Private Limited Company Act” [Wet voor Structuur BV’s]. The BoS supervises the actions taken by the management team (formally the Board of Directors) and the general course of affairs within the company. Three of the five members of the BoS are employees of Teijin Ltd. The explanation for this Japanese majority is that Teijin Aramid is a fully owned subsidiary of Teijin Ltd.

On December 31, 2009 the members of the Supervisory Board included:

- Y. Ichii (1949) – serving since June 1, 2007
  Chairman of the Supervisory Board
  President & CEO of Teijin Holding Nederland BV
- J.C. Breen (1947) – serving since October 9, 2003
  Until his retirement in September 2007 Chairman of the Board of the Van Leeuwen Buizen Groep
  Also member of the Supervisory Board of Ahrend and Koninklijke Smilde
- H. Furuya (1951) – serving since June 1, 2007
  Deputy Corporate Marketing Officer of Teijin Ltd.
- F. Migchelbrink (1946) – serving since October 9, 2003
  Until 2007 CEO of NOM BV
  Also member of the Supervisory Board of Rabobank Noordenveld and Lab Noord
- R.E. Scholten (1958) – serving since 1 July 2009
  President of Teijin Carbon Fibers GmbH

CSR REPORT
Mr. Scholten assumed the membership of Mr. Runneboom, former deputy CMO of Teijin Ltd. as of July 1st. The three members who are employed by Teijin Ltd. were appointed by Teijin Ltd. Mr. Migchelbrink was appointed at the nomination of the Teijin Aramid company Works Council (OR) pursuant to regulation. He represents the OR and maintains contact with the OR.

Two members of the BoS form an audit committee. These members are charged with the audit of the annual financial statements, assessment of internal audit measures and the guarantee of the independence of the outside auditor. The financial director, the outside auditor, and the internal accounting department of Teijin Ltd. participate in the meetings of the audit committee. On request, other employees of Teijin Aramid can be invited to take part in the meetings. This committee’s rules of procedure are set down in regulations adopted in 2007.

Management team
Teijin Aramid’s management team had eight members in the reporting year. One is a Japanese employee of Teijin Ltd., six come from the Netherlands, and one holds Belgian nationality.

The management team is comprised as follows:
- Eiso Alberda van Ekenstein – general manager AFBG
- Gert Frederiks – president Teijin Aramid & commercial director
- Shigeru Hayashida – vice president & manager of production technology
- Wessel Bruining – director of manufacturing
- Jan Föllings – chief financial officer
- Jan Roos – director of research & technology
- Wilfried Claus – director of human resources & organization
- Mark Claassen – manager supply chain

Financial accounting
2008 was the first year that Teijin Aramid made its financial accounting under J-SOX. Our experience with financial accounting under J-SOX is positive. It gives us additional structure and standardization in the management of business processes.

Starting in 2008 we have reported to our parent company in accordance with the IFRS, the International Financial Reporting Standard. This standard is required by law at the European level for publicly traded companies in order to make their financial reporting – and thereby their assessment – comparable, which has a positive impact on the transparency of companies.

Compensation
Our management’s compensation has a fixed and a variable component. For the variable component of the compensation, members of the management team receive equal shares for results-dependent and for personal targets. CSR aspects are part of personal targets, such as the number of LTIs (Lost Time Injuries), contributions to the successful functioning of the Ethics Committee and waste reduction. A comparable arrangement applies to middle management.

CSR governance
The general manager, Eiso Alberda van Ekenstein, bears primary responsibility for CSR within AFBG as well as for Total Risk Management (TRM). Within Teijin Aramid this responsibility is delegated to the President of Teijin Aramid and to Marcel Werner, in his role as CSR/TRM manager. He is to contribute expertise, to inspire people, to facilitate, and to instruct. We have an internal platform of CSR Ambassadors to embed CSR within the organization; they perform this role in addition to or in conjunction with their regular duties. The CSR manager reports directly to the president of Teijin Aramid. He also reports functionally to AFBG’s chief technology officer, who is part of the AFBG management team. Progress, goals, and possible bottlenecks are discussed six times a year, at least one of these times with the entire management team, and there is feedback and exchange of experiences with Teijin Ltd’s CSR manager in Japan. Finally, progress reports on CSR and TRM issues are also made to Japan.

Deshima award
In the framework of 400 years of trade relations with Japan, the Dutch Japanese Trade Federation (Dujat) has issued the Deshima awards for the second time. This award, created as a symbol of appreciation for Japanese companies in the Netherlands, is named for the Japanese peninsula Deshima that was the only place in Japan from 1600 to 1854 where Netherlanders – as the sole foreigners – were permitted to reside.

Minister Van der Hoeven presented the Deshima award to Teijin Aramid and Teijin Holding personally for our role in the community and economy of the Netherlands. The investments made by Teijin Ltd. in Teijin Aramid have had great impact on the economy of the Netherlands as well as on our locations in the Netherlands. Its continuous development was cited as an important reason to single out the organization for the award.
2. The economic crisis
Great impact on the organization

The year 2009 closed with a positive result on operations due to a broad package of measures. These measures had great impact on the organization, but contributed to closing the year with a small profit. In the longer term, the strategy put in place in 2008 will be continued, albeit with the postponement of planned expansions.

Financial performance

Our business was growing according to plan until October 2008. That is when we began to feel the effects of the economic and financial crisis. Monthly sales dropped drastically in the first months of 2009, to below the level of 2005. This drop was caused by a combination of decreased demand for (some) end products and inventory reductions among all players in the chain. There was also growing competition from new suppliers of aramid, chiefly from Korea, and an increased use of substitutes.

For the first time in eight years, the aramid market had over-capacity. Production exceeded demand, putting pressure on prices. In addition, our parent company, Teijin Ltd., recorded a loss in both 2008 and 2009. It was decided to focus on generating cash. Demands on operating capital had to be reduced. The emphasis on cost-reduction was felt everywhere. The crisis worsened in the first half of 2009 and we closed both quarters with adverse results. It was uncertain at the time whether we could continue to work within the credit limits allowed by our main bank.

The second half of 2009 saw gradual recovery of the economy, partly initiated by stimulating measures adopted by various countries. Economic conditions improved slowly in Asia, with the exception of Japan. It felt the negative effects of deflation and the Yen exchange rate. For the first nine months of the fiscal year, our parent, Teijin Ltd., reported a net turnover of 560 billion Yen (about 4,450 million euro), a reduction of 24% over the same period for the previous year. The net loss for this period amounted to 31.5 billion Yen (about 250 million euro), while a net loss of 14.6 billion Yen had been reported in the same period of the previous year.

Despite the slight up tick of the economy, sales of synthetic fibers, one of which is aramid, dropped sharply from their 2008 levels. Due to radical measures, aramid fibers did return positive results on operations. This limited the loss of the Synthetic Fiber Division. Our net turnover represents 20-25% of the turnover for all synthetic fibers.
Creation crisis team
The management team created a crisis team in May. Its members represented the various business segments and production sites: Erik Delnoij (Manufacturing), Bert Gebben (R&D), Philip Altena (Sales & Marketing), Sander Rijerse (Supply Chain), Roel van Eijndhoven (HR&O), with Peter ter Horst (Controlling) coordinating. Two members of the management team supported the crisis team.

The crisis team had three assignments.

1. Institute scenario planning
   The crisis team studied the effects of the economic crisis on four segments of the market: the automobile industry, defense, oil & gas, and telecom. Two scenarios were developed: a positive scenario that assumed a slow recovery and a less positive scenario in which the 2009 situation continued. All sales departments made a three-year plan for both scenarios.

2. Introduce a crisis balance scorecard
   A balance scorecard was developed to gain insight into economic and business parameters, so that the effects of the measures could be tracked in real-time. This economic and business thermometer was published monthly starting in July 2009, becoming part of our monthly reports.

3. Stimulate awareness of the crisis throughout the organization
   There was regular communication on the crisis team’s progress, concrete initiatives, and successful actions through the intranet, bulletin boards, and the company newspaper. There were also a number of company-wide workshops. A successful workshop was held in November with all of our maintenance managers on cost-reductions in production. In December there was a kick-off meeting with the goal of reducing operating capital through optimizing scheduling and logistics. Follow-up comes in 2010, which will also take account of the results of an outside study. The team was dissolved after completing these three assignments and with the lessening of the crisis.

Impact of measures
Since turnover decreased by more than 40% in the first months of 2009 by comparison with third quarter 2008, we looked into whether we would be eligible for the government program on reduced working hours. However, we (barely) failed to meet the most important criterion of at least 30% loss of sales in a period of two consecutive months versus the comparable period of the preceding year. We then considered part-time work plus unemployment insurance [deeltijd-WW]. On top of the large package of cuts already set out at the close of 2008, it was further decided in March 2009 to make an additional cut of 7 million euros from fixed labor costs.

We achieved this goal with the following package of measures:

- No increase of permanent employees
- Practically no outside recruitment and selection
- Phase out flextime workers
- Phase out accrued leave balances (vacation + leave) to zero (day shift + shift workers)
- No collective salary increase
- Fine tooth comb through labor costs (including overtime, staff outings, business travel, meetings and conventions)
- 10% reduction in labor capacity among dayshift workers through phasing out accrued leave balances for employees under the Collective Labor Agreement (CLA)
- Non CLA-personnel: 10% reduction in labor costs

Trend in Net Sales Teijin Aramid
Index compared to 2005

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Phase out accrued vacation and leave
One of the largest savings was achieved by phasing out accrued days of vacation and leave. This had a major impact on our employees. It turned out to be very important to make good arrangements within the department and with supervisors about availability, reachability, and priorities. We also made use of the government’s “knowledge workers” regulation and stimulated voluntary outflow, part time work, taking unpaid leave, and using the life-course savings plan (levensloopregelingen).

Phase out flextime workers
Nearly all contracts with flextime workers were terminated over the course of the year. A total of 200 temporary workers left our company. When the market showed the first signs of recovery at the end of 2009, we built the flextime team back up. (see Figure).

Forgoing salary increases
The management and leadership team also individually waived a previously granted salary increase, payment of profit sharing for 2008 was postponed to 2010, and we phased out all accrued leave and purchased and used up all additional leave. By reducing business travel considerably, we achieved nearly a 30% reduction in business kilometers traveled.

Temporary production stop at Delfzijl
The factories in Delfzijl were shut down for two months due to the economic crisis. The preference was for a complete halt in production rather than to continue at half capacity. First of all, the plants run more efficiently at full load, and secondly, a complete shutdown could be used to carry out maintenance and outstanding work, to use up leave, and to take training courses.

Personnel recruitment and training budget
Not all personnel recruitment activities were stopped. We decided to recruit new employees to fill gaps in critical functions that arose from natural outflow, because these people could play an important role in the recovery from the crisis. More interns were taken on.

Teijin Aramid also decided not to make drastic cuts in training; 0.3% of net turnover was earmarked for this, comparable to the preceding years.

Change in FTE
Index compared to 2005

<table>
<thead>
<tr>
<th>Month</th>
<th>Number of FTE contracted</th>
<th>Foreign Sales organization</th>
<th>Number of FTE engaged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>1,600</td>
<td>1,100</td>
<td>1,500</td>
</tr>
<tr>
<td>Feb</td>
<td>1,550</td>
<td>1,100</td>
<td>1,450</td>
</tr>
<tr>
<td>Mar</td>
<td>1,500</td>
<td>1,100</td>
<td>1,400</td>
</tr>
<tr>
<td>Apr</td>
<td>1,450</td>
<td>1,100</td>
<td>1,350</td>
</tr>
<tr>
<td>May</td>
<td>1,400</td>
<td>1,100</td>
<td>1,300</td>
</tr>
<tr>
<td>Jun</td>
<td>1,350</td>
<td>1,100</td>
<td>1,250</td>
</tr>
<tr>
<td>Jul</td>
<td>1,300</td>
<td>1,100</td>
<td>1,200</td>
</tr>
<tr>
<td>Aug</td>
<td>1,250</td>
<td>1,100</td>
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</tr>
<tr>
<td>Sep</td>
<td>1,200</td>
<td>1,100</td>
<td>1,100</td>
</tr>
<tr>
<td>Oct</td>
<td>1,150</td>
<td>1,100</td>
<td>1,050</td>
</tr>
<tr>
<td>Nov</td>
<td>1,100</td>
<td>1,100</td>
<td>1,000</td>
</tr>
<tr>
<td>Dec</td>
<td>1,050</td>
<td>1,100</td>
<td>950</td>
</tr>
</tbody>
</table>
“Teijin Aramid has been working for a number of years quite consciously and consistently with the development and implementation of CSR. We are seeking to make a transition from the simplistic position that our product often results in something that is sustainable to make a strategic choice for more sustainable processes and products. That will not be done in a single year and demands an intensive process of change. Eco-Efficiency analyses of existing and new products and processes are a help, but the ‘softer’ processes in which we determine, together with many people from the organization, what are our values and conduct associated with these, are of critical importance in my view. I have emphasized the value of CSR, among other ways, by largely maintaining our efforts in this area even throughout the difficult crisis year of 2009, despite the enormous pressure to reduce or, if possible, to stop all activities that do not directly earn cash. I view the care for a livable world also as a personal obligation to my own children.”

Eiso Alberda van Ekenstein, general manager AFBG
3. Our CSR strategy
**Choices, chances, and dilemmas**

*A conscious and consistent CSR policy has led to a definite choice for sustainable processes and products. How is CSR integrated in practice in duties, roles, and responsibilities? What is its influence on our core processes? A summary.*

**CSR compass**

*Four directives as compass*

To give better direction to our CSR efforts, we have adopted four scientifically supported directives for sustainability. These come from The Natural Step, a non-profit organization with the goal to create a sustainable society. These directives are based on the insight that we, as people, are making ever-greater demands on the quantity of natural raw materials that the planet has available. Moreover, we are making demands on the earth, that it purify water and air ever more quickly, keep agricultural lands fertile, and absorb our CO₂ emissions. If we sketch this situation, we see the following funnel.

This appears to be untenable if we do not change our behavior collectively. Nevertheless, we believe there are options enough to widen the neck of the funnel in which we are maneuvering. We can make a fundamental contribution to this with our products. By making sure that our end products are stronger, more durable, safer, more heat-resistant, or lighter, we find that many of our products are intrinsically sustainable and make evident contributions to a better world.

We are proud of our products and their applications. But we are also facing challenges. We have clear ambitions and sense that some are more easily achieved than others. The four directives guiding our actions are these:

1. We only use raw materials from the earth’s crust in such a rate that nature is able to regenerate them.

2. We prevent the increase of man-made products and waste in nature.

3. We prevent the degradation of nature and ecosystems by human action.

4. We take account of the fact that human beings must provide for their basis needs.
CSR policy in 2009

Environment and eco-efficiency
We formulated many goals in the area of the environment (see also Chapter 6). We have linked some of these as key performance indicators (KPIs), to our management activities. We have KPIs for energy efficiency, emission of chemical substances, non-efficient use of waste, lost time injuries, failure to comply with permitting requirements, and failure to correct on time any deficiencies found during audits. We also have goals for the recycling of aramid and for the number of incidents that require a report.

We want to complete four energy efficiency plans (EEP) in July 2010. With these, we will have fulfilled our multiyear agreement (MJA-3) with the government. We also want to measure our carbon footprint accurately.

Sustainability criteria are an integral element of our decision-making process. These take on concrete form by using Eco-Efficiency analyses (EEA, see Chapter 6) when deciding whether to develop new products, to improve processes, or to bring out the value of our products in the entire chain. The sustainability criteria are also part of our project navigator (see Chapter 5), an instrument that we use so that projects run as properly as possible.

Ethics and integrity
A few years ago we launched a program on ethics and integrity, which became part of our PURE program in 2009 (see Chapter 1). Personnel are encouraged to discuss dilemmas, especially those involving ethics and integrity, with their colleagues or supervisors. PURE is therefore also part of our ambitious program for leadership development. We have included integrity questions in our job interviews; these play a part in the assessment of potential employees.

There is also an Ethics Committee, which primarily supervises compliance with the code of conduct. The members of this committee have a duty of confidentiality. It is possible to approach these people anonymously.

“Our customers’ future needs and added value in the entire value chain: these will be decisive for companies’ financial health. Moreover, these are of overriding importance for attracting investors and assuring long-term financing. Sustainability must therefore be an integral element of our business concept. Solving the shortage of natural additives, the protection of the climate, and the contribution to tackling social issues in the world must be part of our day-to-day thought process and work. That will best succeed by giving our own future as sustainable a form as possible.”

Jan Föllings, chief financial officer
**Recycling ambitions**

We try to collect as much aramid as possible and to convert it in our recycling plant to Twaron pulp. But we must also accept that our product is integrated in various applications with other materials and that it sometimes takes more energy to separate these than can be justified ecologically. Moreover, the possibility for reuse is less important in a number of applications. All applications in the ballistic market have only one requirement: our product must provide maximum protection to save human life. By chance, bulletproof vests recycle very well, but hardened ballistic applications, such as armor, are quite difficult to recycle.

We have made a product that is highly resistant to nearly everything and that is especially strong; it does not rust, it does not fall apart from water penetration, does not melt, and dissolves in nearly nothing. That is Twaron’s value as an application and so it is quite logical that Mother Nature cannot break down this product on its own. That is why we find it acceptable for now that, after a long product life in which it has saved a great deal of energy, Twaron is burned (thermal recycling). We can demonstrate quite well through the EEA that this is still more eco-efficient than the alternatives available for Twaron.
Nearly all our raw materials and additives come from oil. Our research is aimed primarily at performance improvement and updating of product and process and not on reducing the environmental impact of our raw materials. Our goal is to include an EEA as part of the R&D phase. We have just started this.

Our R&D efforts also include looking for options to reduce the waste released during production as much as possible. With the project navigator we take account of recyclability when weighing the alternatives for product and process development at various stages. This is not a 'go/no go' criterion for us, however.

Our research is focused primarily on performance improvement and updating our products and processes, whereby we contribute to energy savings. The EEA is used to strive for the optimum in the area of environmental impact. The plant in Delfzijl is nearby the Waddenzee; the environmental association is satisfied.

Many of our products we produce contribute to an 'improvement of the quality of life' by offering protection or saving energy.

We track the development of realistic other raw materials. Employees recently completed a study into strategic purchasing. In logistics we still deal regularly with emergency orders using air shipments. We could take this more into account in order to reduce our CO2-impact.

There are agreements on the reuse or collection of packaging materials or pallets (internally and externally) where economically feasible. We built a evaporator in Emmen for the recycling of sulfuric acid, which has had a great impact on the deliveries of this solvent.

There are agreements with key suppliers on minimizing their environmental impact. We have covered approximately 80% of our purchasing volume with a supplier statement. It is still not a dominant criterion for the selection of suppliers. We want to be more pro-active in implementing this test.

There are agreements with key suppliers on compliance with Global Compact principles. We have not yet approached all suppliers about this, however.

The economic crisis revealed that our environmental achievements are highly dependent on production volume; lower volume yields lower results. We emit rep toxic substances and produce a (limited) quantity of non-efficient waste. Despite this, we do our utmost to limit emissions to a minimum but, unfortunately, have had emissions incidents. Combustion of our product is relatively clean (CO2 and water).

We follow the Responsible Care principle in our work. We comply with the law and try to keep account as much as possible of the effect of our operations on the environment.

We are continuously working to innovate our processes and develop better or new products which will contribute to a better quality of life: There is a great deal of attention paid to safety in our production process. People are given space to develop themselves. We take account of the environment and of diversity.

Many of our products we produce contribute to an 'improvement of the quality of life' by offering protection or saving energy.

Application of our products leads, for example, to energy savings. Our products are sustainable in use allowing postponement in the replacement of equipment and materials. We are starting to make this visible through the EEA.

We do not supply customers that we know violate our ethical standards. Our products may not be resold to unknown parties. Setting boundaries remains a work in progress.
Challenges and priorities in 2010
The focus of 2010 will be on three challenges and priorities. It is ‘the year after crisis year 2009’, the year of further integration with the Japanese part of Teijin Ltd’s aramid organization. And, finally, 2010 is the year for the rollout of our PURE business values.

Balancing the short and long terms
One challenge in ‘the year after crisis’ is to find the right balance between short term cost improvements and long term opportunities for growth. The tension between the short and long terms is clearly visible in our R&D program. This process is more difficult since our parent company, Teijin Ltd., is still not doing all that well and we have made a significant contribution over the years to Teijin Ltd’s profits. One expects considerably improved results from our company in 2010 by comparison with 2009, while knowing this still will not be at 2008’s levels.

Organizational changes
Because of the further interweaving of our aramid activities with those in Japan, to be made final in the first half of 2010, there will be organizational changes. A large number of managers will receive different responsibilities and reporting lines. The right balance between Japanese and European culture will be sought in the area of management and reporting. A balance will also be sought for CSR between themes found to be of common importance and regional points of concern.

PURE in practice
PURE will be given a top-down rollout; managers will provide the example. The management team has gone through a 360° feedback process, as a start for a further rollout in 2010 to the next layer of management below it. An employee satisfaction survey will be taken again in 2010.

Dialogue with our stakeholders
Writing the 2008 CSR report and the planned outside verification were reason at the time to enter into dialogue with a number of stakeholders about CSR. We found the initial meetings to be most positive. That is why we expanded the dialogue to other stakeholders, such as employees, other units of Teijin Ltd., customers, suppliers, neighbors, nearby companies, institutions of knowledge, governments, non-governmental organizations (NGOs), banks and industrial organizations. We are seeking to take better account of their positions and to use their input in taking decisions and tightening the focus of our CSR strategy.

Broad dialogue with our customers on our mutual CSR efforts is on the agenda for 2010. One reason is that they sometimes ask us about the carbon footprint of our products. We will use these occasions also to talk about our efforts in the area of the EEA. We will also provide statistical support to show clearly how our products contribute to the sustainability of the entire chain.

On the following page is a summary of our activities for groups of stakeholders, with comments about their concerns and wishes and our response to these.

Dialogue with the Royal Bank of Scotland
In the year of the financial crisis we developed a valuable dialogue with one of our most important stakeholders, the Royal Bank of Scotland, RBS.

RBS, our new main banker since 2009, is among the ten largest banks in the world. We have discussed CSR with this bank’s account manager because of the fact that RBS was under pressure, particularly in the UK, due to criticism of its investments in oil companies, because of which it was known as ‘the oil and gas bank’. Media attention to a number of heavily environmental polluting projects brought the bank into discredit, which was the background to our entering into discussions with them. Our CSR people are now in direct contact with those having CSR responsibilities within RBS. We know that RBS wants to focus more on investments in green energy. It is important for us that we remain in dialogue with RBS on these themes. And not only with RBS, but also with other, especially Japanese, banks with which we want to do business. We have decided to discuss CSR with each bank we do business with in 2010.
<table>
<thead>
<tr>
<th>Employees</th>
<th>Stakeholders’ concerns and wishes and our response</th>
</tr>
</thead>
<tbody>
<tr>
<td>• PURE program (MT &amp; leadership team)</td>
<td>• Organizational culture (more collaboration, openness, integrity)</td>
</tr>
<tr>
<td>• Presentation of CSR awards</td>
<td>• Rollout of PURE in leadership team and preparations for its further implementation</td>
</tr>
<tr>
<td>• Extensive information on intranet, various explanations of sustainability, and how that affects our organization, including inspirational films, nomination of CSR Ambassadors and quotes from stakeholders</td>
<td>• Salary increases (salary increases frozen due to the economic crisis in 2009)</td>
</tr>
<tr>
<td>• Regular CSR communication via intranet homepage, including tips for shop floor and home</td>
<td>• Explanation through personal letters and meetings with supervisors</td>
</tr>
<tr>
<td>• Training and development such as Decagon and the leadership program</td>
<td>• Intranet is not accessible to everyone</td>
</tr>
<tr>
<td>• EEA presentations within various organization units</td>
<td>It was a management decision not to make the intranet available to all our factory employees through an individual PC</td>
</tr>
<tr>
<td>• Development and pilot for CSR training</td>
<td></td>
</tr>
<tr>
<td>• Annual training in health and safety</td>
<td></td>
</tr>
</tbody>
</table>

| Customers                                                                |
|-------------------------------------------------------------------------|------------------------------------------------|
| • Customer satisfaction survey                                           | • Question on our products’ carbon footprint and future financial burden for CO₂ emissions |
| • Customer presentations on developments concerning increasing taxes for CO₂ emissions | Supply of information requested along with explanation by experts on calculation methodology applied. |
| • Proactive dialogue with universities                                   | Presentations to customers, completion of pilot Eco-Efficiency studies and extension to other products |
| • Detachment of four employees to scientific projects through the knowledge workers arrangement | • Need for more information about our products and most recent developments |
| • Student workshops, opportunities for students to learn more about our company | We developed a digital newsletter, the first of which has recently been issued |
| • Participation in university days to bring efforts on sustainability and innovation to the attention of potential employees | • Faster follow-up to questions or complaints. |
| • Guidance of interns                                                    | We began a process for guaranteeing handling of complaints within the organization so that it is uniform and organization-wide for all marketing groups, and leads to faster handling |

| institutions of knowledge                                               |
|-------------------------------------------------------------------------|------------------------------------------------|
| • Risk/concern that we are too small an organization to develop knowledge about high performance fibers and composites on our own | • Proactive dialogue with universities |
| • Detachment of four employees to scientific projects through the knowledge workers arrangement | • Customer satisfaction survey |
| • Student workshops, opportunities for students to learn more about our company | • Customer presentations on developments concerning increasing taxes for CO₂ emissions |
| • Participation in university days to bring efforts on sustainability and innovation to the attention of potential employees | • Proactive dialogue with universities |
| • Guidance of interns                                                    | • Customer satisfaction survey |
| • Expansion of the number of suppliers’ certifications, particularly for technical materials | • Customer satisfaction survey |

| Suppliers                                                                |
|-------------------------------------------------------------------------|------------------------------------------------|
| • Expansion of the number of suppliers’ certifications, particularly for technical materials | • Risk/concern that we are too small an organization to develop knowledge about high performance fibers and composites on our own |
| • Rollout of PURE in leadership team and preparations for its further implementation | • Risk/concern that we are too small an organization to develop knowledge about high performance fibers and composites on our own |
| • Salary increases (salary increases frozen due to the economic crisis in 2009) | • Risk/concern that we are too small an organization to develop knowledge about high performance fibers and composites on our own |
| • Explanation through personal letters and meetings with supervisors | • Risk/concern that we are too small an organization to develop knowledge about high performance fibers and composites on our own |
| • Intranet is not accessible to everyone | • Risk/concern that we are too small an organization to develop knowledge about high performance fibers and composites on our own |
| It was a management decision not to make the intranet available to all our factory employees through an individual PC | • Risk/concern that we are too small an organization to develop knowledge about high performance fibers and composites on our own |
4. Safety, health and welfare
Focus remains on improvement
Our policy is aimed at sending our employees, contractors, and visitors home healthy after work or their visit. We also want to prevent incidents. This sets high demands for employees, managers, and the organization as a whole. That is why we are constantly seeking improvements to work safety, health and process safety.

Our health policy’s three most important goals are:

1. To create a productive work environment for all our employees, in which they can enjoy working;
2. To strive for healthy employees in a healthy work environment. This encompasses more than merely reducing health-related absences. Teijin Aramid has developed an integrated health policy for this.
3. To create a safe work environment without Lost Time Incidents (LTIs): accidents whose victim is not able to work on the following working day.

Standards, directives, and audits
QHSE management system
We have been certified for ISO 9001 (quality) since 1993, for ISO 14001 (environment) since 1996, and for OHSAS 18001 (safety and health) since 2002. This means that activities at all locations follow the procedures set out in our Quality, Health, Safety and Environment (QHSE) management system. That ensures a uniform approach to work and benefits the quality of our products. One of the requirements brought out by the QHSE system is that continuous improvement is needed in the areas of quality, environment, safety, and health. The internal audits conducted several times a year contribute to this. This has yielded, among other things, improved follow-up to action items in recent years. There was a backlog for the modification of procedures due to the recent organizational changes.

In addition to audits by our own trained employees, a periodic audit is conducted by our certifying entity, Lloyds Register Quality Assurance. Lloyds approved us in 2009 for the newest version (2008) of the ISO 9001 standard. Teijin Ltd. also conducts a QHSE audit every other year at all our locations. This checks where we are adhering to the directives imposed by our parent company in Japan.

5S method
One of the directives from Japan concerns working according to the 5S method, aimed at a well-organized work environment. 5S stands for five Japanese words:

- **Seiri** = separate and clear away
- **Seiton** = sort and organize
- **Seisō** = clean and inspect
- **Seiketsu** = systematize and standardize, and
- **Shitsuke** = persist / maintain change

Teijin Ltd. has been applying this method for a number of years and, according to the results of audits, we are on the right track.

Directive on Risks and Severe Accidents
The Emmen and Delfzijl production sites are subject to the Directive on Risks and Severe Accidents (BRZO), because of the hazardous substances we use and store. Our Emmen production site falls within the light category of BRZO companies. This means that, for Emmen, we also must have a Major Accident Prevention Policy and a Safety Management System. The Delfzijl site uses more chemical substances (including chlorine, aniline, sodium nitrite, and hydrochloric acid) and therefore falls into the heavy category. This location must also institute safety reporting that includes scenarios for the management of various risks. Governmental representatives of the Province, the Health and Safety Inspectorate, and the regional fire department conduct a BRZO inspection each year.

Safety
Improve worksites
All of our factories have an integrated and certified QHSE management system. The efforts and investments made in past years were particularly aimed at the improvement of
worksites. This applied the 5S method and technical modification to improve ergonomics. We also devoted a great deal of attention to learning to detect unsafe situations and to increase safety awareness. This was supported by the 2VA program (‘Veiligheid Voor Alles’ or, ‘Safety First’), and by two internally produced video campaigns: ‘From Codes to Conduct’ and ‘Let Your Safety Show’.

**Personal risks**

We are continuously evaluating our processes and evaluating personal risk in the performance of our work. This leads, not only to better working methods and procedures, but also to greater efficiency, including improvements through technological changes. Thus, a fully automated fiber baling press was installed and yielded significant ergonomic improvement.

**Process safety**

New insights into risk management lead to additional technical measures in older installations, and include large investments arising from Hazard and Operability studies (HAZOPs) and Safety Integrity Level (SIL) classifications. We also improve the safety of the work by looking more critically at the implementation of work permits and task-risk analyses associated with them.

**R&D**

The employees in R&D work with a wider variety of chemical substances than anyone within Teijin Aramid. That is why we give more than ordinary attention to safety here. In addition to the standard safety routines and instructions, attention is especially paid to specific laboratory aspects, such as the advance collection of detailed information on substances. The same holds for new processes, where we map out all conceivable consequences.

**Customers**

We also feel great responsibility for the safety of our customers. That is why we have conducted a large number of studies into the health aspects of Twaron, particularly because it is a replacement for asbestos. These have shown there is no health risk whatsoever in the processing and use of Twaron when done according to the instructions. We are also studying the behavior of Twaron under increasingly extreme conditions; also for these applications we want to exploit to the maximum, and with full assurance, the sustainable role that Twaron can play. Some examples of these are thermoplastic pipes and gas cylinders and canisters.

**Safer working in Emmen**

QHSE specialists are charged with safety at our locations. Various safety activities were organized in 2009 at our Emmen production site, including a number of safety training programs. One of these had the appropriate name ‘Let Your Safety Show’. The goal for this program was knowledge sharing and involved six employees working at other production sites for a number of days. They shared their experiences with supervisors and management and then, in 2009, with all employees at their own location.

**Training**

Signaling and responding to unsafe actions and situations is important for the prevention of incidents and accidents. In 2003 and 2004 some 700 employees in Emmen were trained to learn how to spot and tackle unsafe situations through 2VA training (“Safety First”). This has led to a further decrease in the number of accidents. In 2009, 24 new employees took this training. The agenda for 2010 includes periodic refreshers of this 2VA training.

The Emmtec industrial park has a Site Emergency Service (LHV) organization for emergencies; we are part of this LHV. These emergency workers use gas-suits in disasters involving emission of hazardous fumes, such as fuming sulfuric acid. As the number of companies in the park
decreased, there was a sharp drop in the number of emergency workers. In order to reinforce the team of people qualified to use gas-suits, twelve additional emergency workers were trained.

They hold exercises for various disasters: clearing buildings, a fuming sulfuric acid alarm, an industrial fire, and an accident involving a hazardous substance. The industrial fire exercise was conducted jointly with the Emmen Fire Department in the upper stories of the spinning facility. This exercise showed that good company information about the hazardous substances present and access to spaces is essential for rapid response. The supporting services, such as the municipal fire department, turned out to have insufficient information.

Studies and analyses
A number of incidents in the past showed there was insufficient attention given to process safety. One of the points of concern is the inventory of risks associated with processing plant and equipment and how these can be managed. We do this through HAZOP studies. In 2009, these studies were conducted into the fuming sulfuric acid and paraffin systems.

We apply the Tripod analysis, among others, in order to derive maximum learning from incidents. Using this instrument, both the direct and underlying causes of an incident are described, after which measures must prevent it being repeated. Nine people were trained in 2009 in the preparation of Tripod analyses.

System
A safe installation must also remain safe. That is why any changes planned for an installation must first be requested, assessed, and approved before being implemented. We call this a Change Request, or VTW in Dutch for Voorstel Tot Wijziging. We created a VTW database in 2009 to assess and track changes systematically. This is done monthly by a VTW Group.

Safer working in Delfzijl
A great deal has been done in the area of safety at our Delfzijl site. The GOUD improvement project (see Chapter 7) has increased safety awareness since all employees have been trained in it. Also, a BRZO inspection was made and the necessary responses were carried out. A BRZO scenario was exercised twice, including a simulated para-xylene puddle fire in the tank pit.

Serious incident
Despite our attention to work safety, a serious incident occurred in Delfzijl. A sampling point under a reactor still loaded with product was dismantled, releasing the entire contents of the reactor. The mechanic from the supplier was injured from being sprayed with hexachloro paraxylene (HCPX), a chemical substance with a temperature greater than 100 °C. The effect of HCPX is comparable to candle

A safer and faster assembly comb
One of the priorities to making work in Emmen safer is preventing employees from coming into contact with the yarn, which races through the factory at extremely high speeds. Machine operator Henk Jeuring conceived how the assembly comb could work more safely and also how more A-quality yarn could be produced. He designed an assembly comb that combined yarns in one operation so they could be separated later as needed. The work became safer as a result and went considerably faster. This is an outstanding solution for safety and production, which is also evident from the amount of the award he received for it: € 20,000.

254 ideas were handled in Emmen in 2009. Those actually implemented yielded savings of about € 200,000. Of the ideas actually taken up, 10% were rewarded with an average of € 1,250.
Health and welfare
Teijin Aramid wants to have healthy employees in a healthy work environment. In addition to absence from illness, health also includes our moral, mental, and physical well-being.

Teijin Aramid has implemented an integrated health policy. Our goal is 0% avoidable absence from illness. Part of the health policy is the encouragement of a healthy lifestyle. This will enable our employees to be properly deployed over the long term. Attention to this will only increase in coming years due to the aging of the employee-population and possible raising of the retirement age to 67 years. The average age of employees in the chemical industry is 43 years; for Teijin Aramid it is 44 years.

Since Teijin Ltd. attaches great value to the teaching value of this type of serious and unfortunate incidents, the results of all analyses have been incorporated into one presentation. This was presented internally at our production sites in Emmen and Arnhem and externally at Stork, Delesto, Lubrizol, Akzo Nobel, and SBE. In addition, all safety officers in the Delfzijl chemicals park have seen the presentation.

It all adds up
Encouraging a healthy lifestyle was implemented in Arnhem through the health project ‘It All Adds Up’. This project included a quick scan of physical stress by the Research Institute, creating stress profiles in the Kleefse Waard plant, and fitness tests for employees. Also, some employees were trained as ergo-coaches and worksite studies were conducted. There was also training to reduce work stress perception while sports clinics were also organized. To encourage participation in sports, memberships in sports clinics were arranged to permit employees to participate at reduced fees. This health project will be continued in the coming years.

In 2009 our percentage of health-related absence unfortunately rose sharply from 4.4% in 2008 to 5.2%. The graph below shows the change from base year 2005.
In addition to LTIs we report on Restricted Work Cases (RWCs), in which an employee cannot resume his own tasks temporarily after an accident but can perform appropriate work, and Medical Treatment Cases (MTCs), in which, after treatment by a physician, an employee can resume his own tasks. The Total Recordable rate is the total of LTIs, RWCs, and MTCs.

Health-related absences
Particularly on our production sites we had to phase out our flextime workers because of the crisis. Our permanent employees had to absorb this work. This increase in workload led to more health complaints, especially in Emmen. Delfzijl saw an increase in the number of long-term illnesses as well as a rise in short absences (“flu”). We want to reduce our employees’ vulnerability by expanding the number of flextime workers and through further automation and use of robots at the production sites, and in Emmen in particular.

Lost Time Injury’s
Our efforts in past years had led to a reduction in the total number of incidents and a decline in the LTI frequency rate (number of LTIs per million hours worked). In 2008 we had 5 LTIs versus 2 in 2009. The related LTI frequency rates were 2.2 and 1.0, respectively. The goals set by Teijin Ltd. in this area mean that we must achieve an LTI frequency rate of 0.3 in 2011. That means that we will not meet that goal if there is even one LTI. That means that we will have to attain that frequency rate in some other way; not year by year, but perhaps by calculating it over a period of three years.

Prevent crises or disasters
We strive to be well prepared for disasters and crises. We have a number of systems and procedures for this. Many risks are evaluated and tackled through the risk management system, which we use to estimate and rank risks in a systematic and continuous way. These risks differ widely: financial, operational, commercial, and damage to reputation. Risks can be external, also, such as changes in law or at the labor market. We use risk ranking to determine whether the measures we have taken are appropriate for the scope of the risk.

Finally, we have begun to make loss and risk prevention an integral part of project implementation. This brings an insurance broker into the project at an early stage to determine whether, from the point of view of insurance, the project has built-in undesirable and avoidable risks. This could result in having a new activity carried out in a separate building rather than alongside current activities.

“Human behavior and performance is shaped significantly by the work environment. The conscious and unconscious behavior of supervisors plays a highly important role.”

Hedzer Rozeboom, safety officer
It could mean that we locate the new activity at a greater distance from existing equipment than we had originally planned. The amount of investment could be greater, but insurability better and therefore the premium to be paid lower. The ultimate goal is to reduce risk.

**Fire prevention in the R&D lab**
A good example of loss and risk prevention is fire prevention in our R&D laboratories. We are not required by law to make any improvements here and our insurer also does not require any additional measures. And yet, it turned out after we applied our risk management methodology that we were exposed to major risk in case of fire in our lab and the test factory. So we brought in experts who proposed measures for maximum fire prevention at minimum expense. Their findings were made part of the reconstruction plans for our R&D building.

**Swine Flu**
It was important for us to limit the possible effect of the outbreak of the Swine Flu on our employees and their families. It was also important to offer solutions to prevent or limit its possible negative effect on our company. We adopted a number of preventive measures. A crisis team was formed and then an action plan, a business continuity plan, and a communication plan were drawn up. Business travel was limited where possible. From September through December the number of people reporting sick due to flu symptoms did rise but happily we had no serious cases.

“In my area of responsibility, I translate intentions into concrete goals and activities, including personal targets for myself and the responsible line managers. These include the number of LTIs and RWCs, health-related absences, the number of environmental notifications and external incidents. Energy savings from operational improvements and the application of new technology are also within my area of responsibility. My people and I are assessed and rewarded based on the activities we undertake and on results that contribute to the sustainability of our operations.”

Wessel Bruining, director manufacturing
5. Innovation and collaboration

- Interaction leads to better products
- Open innovation
- Balkenende shows interest in innovation
- Customer satisfaction and customer loyalty
- Sustaining the chain
- Sustainability ‘upstream’
- Innovation in aramid and TPEs
- Sustainability ‘downstream’
- Lighter tires, lower fuel consumption
- Twaron’s carbon footprint
- Project navigator expanded with QHSE navigator
Interaction leads to better products

*Sustainability is a responsibility for the entire chain and is strongly benefited by innovation and collaboration. How do we view our role and position in this and to what results have our efforts led?*

We want to be a reliable partner for our customers in terms of quality, reliability of supply, accessibility, and openness: the human dimension of a high-tech environment. We want to know where and how we can improve our performance. Interaction teaches us a great deal about the markets in which we are active, and is a fruitful resource for product development. Social change also stimulates us to find new, environmentally friendly solutions in markets where we are not yet active. That applies to new, high-performance applications that may be lightweight, energy-efficient, heat-resistant, chemical-resistant, safe, or maintenance-free.

Open innovation

We are willing but selective in applying open innovation. We have an extensive and active network of institutions of knowledge and contract laboratories to carry out research. This can sometimes conflict with concerns about our intellectual property rights. For some strategic, core technologies, we will not share the “core” with others. But we do share many developments with universities and contract laboratories and have had positive experiences. This can speed up projects considerably. We are simply too small in our corner of the world to innovate using our own resources as fast or faster than China, for example. One measure of our innovative strength is that we apply for 15-20 patents annually; this is a nice score for a chemical company of our size. Our percentage of turnover associated with process and product innovation is also relatively high. Customers often view us as a leader in product development and value the partnerships we enter for this.

Balkenende shows interest in innovation

*Netherlands Prime Minister Balkenende visited Teijin Ltd. in Japan in October for the celebration of 400 years of trade relations between the Netherlands and Japan. He was received by the Chairman of Teijin’s Supervisory Board, Mr. Toru Nagashima, the president & CEO of Teijin, Mr. Shigeo Ohyagi, and the Dutch General Manager of AFBG, Eiso Alberda van Ekensteijn.*

There was discussion during the meeting about the importance of innovation and research for both Japanese and Dutch society and the strengthening of collaboration in this area between both countries. The Prime Minister also expressed his interest in Teijin Ltd’s innovation and visited our showroom to see a number of innovations, including a concept lightweight car made of high tech and environmentally friendly materials.

Customer satisfaction and customer loyalty

Instead of *customer satisfaction* we prefer the term *customer loyalty*, since a satisfied customer does not necessarily equal a loyal customer. We seek to create a relationship expressed through common work on the development and improvement of products and revenue.

We conducted a survey of our customers’ satisfaction and loyalty that used the Net Promoter Score (NPS). This score reflects the group size of the company’s ‘promoters'; these are satisfied and loyal customers prepared to recommend us to others. This group appears to be relatively large: the NPS was 35%, against an average of 10%.

“We see Teijin Aramid as a most reliable partner that always fulfils its agreements. That is why we take on the risks associated with multi-year agreements.”

Prof. dr. ir. Sybrand van der Zwaag, TU Delft
Until now our supplier certification related primarily to environmental management and ethics, by which we want to arrive at a point at which the products and services that we purchase are made in accordance with our criteria. These are based primarily on the guidelines of the United Nations Global Compact and the International Labor Organization (ILO). About a third of our total volume of purchases is now covered by a supplier certification. For centrally purchased raw materials 90% of suppliers have signed our declaration. That is 65% of suppliers of additives and 80% of suppliers of technical materials. The majority of our volume of purchases by far comes from West European countries. Companies in this region are performing relatively well in terms of environmental management and ethical transactions. The logistics route to our factories is usually short. For these reasons, there is little more profit to be wrung from these.

Sustaining the chain
In 2009 we received the first requests from our customers that we subscribe to the UN Global Compact guidelines, on the carbon footprint of our products and on noxious substances in our product or production process. We are convinced that this sort of request will be made more frequently. We are studying how we, from our position in it, can further stimulate the sustainability of the chain, both upstream (our suppliers) and downstream (our customers).

"The previous CSR report made a very good impression, read well, and was well organized. You could be more specific, however, in quantifying what you have achieved. The data provided was cursory."

Bernard Defraye, CIRFS

Sustainability “upstream”
Supplier evaluations
Nearly five years ago we began a project for ‘sustainable purchasing’. We set criteria for suppliers, analytical methods, and procedures and made a first assessment of the most important suppliers of raw materials and additives. In the following years we added other areas for purchase, including technical equipment.

Although Teijin Aramid is one of the two leading aramid producers in the world, we are a relatively small customer to most suppliers. But we can achieve something with our supplier evaluations and be more selective in choosing our suppliers.

Supplier certification
We will be asking our suppliers about their carbon footprint so that we can try to keep this as small as possible for our end product. We also take account of the distance between supplier and our plants. Ultimately, this will yield not only a reduction of our effect on the climate but also financial benefit.

Place in country rankings
We purchase the majority of what we need centrally. The central value of purchases in 2009 was a good 130 million euros. Using the Corruption Perception Index (CPI), we have checked whether the conduct of transactions in the countries from which these goods come fits with our vision of ethics. This index reflects the impressions held by experts on political corruption in 180 countries. Its data is derived from ten independent institutions and turned into country rankings once a year. These rankings are on a scale from 0 (very corrupt) to 10 (entirely incorrupt). We have concluded that 85% of our suppliers score 7.5 or higher, and 15% between 5 and 7.5. Less than 1% of our suppliers come from countries with scores between 2.5 and 5 points.
Improvement of technical performance and recycling
That is not to say that we can do nothing. We are seeking the improvement of the technical performance of our products. We have worked successfully in close collaboration with one of our customers toward a fiber with a low amount of finish. Finish is a sort of lubricant applied to our product for ease of processing and better performance. A nice coincidence is that decreasing the amount of finish yields an environmental benefit. This is one way that we can distinguish ourselves in a niche market.

Another is recycling. This is usually difficult in this same composites market since many end products use reinforcing materials, such as our Twaron fiber, embedded in a resin. Only if that resin can be melted, the fiber and resin can be separated. For the time being, we do not think it makes much sense for such a small player in a niche market to devote too much energy in promoting such recycling options.

Sustainability in the automobile industry
We prefer to focus our energy on products and markets that could make a major contribution to the further sustainability of the chain. That applies to the automobile industry, which, like the aircraft industry and the wind energy sector, has a growing need for lightweight, high performance materials, and has great interest in sustainability.

We are seeing a trend in Europe of greater and greater demand from automobile manufacturers for a tire made from lightweight material with high strength. The consumer will also start to demand cars with low CO₂ emissions because of the link between road taxes and CO₂ emissions. The application of more lightweight materials in the automobile sector will be accelerated because of this. We see market opportunity there and are making it clear in meetings with customers that our product can contribute both ecological and economic benefits.

A combination of law and regulation, along with a financial prod to the customer, will lead to sustainability in the chain. European legislation was adopted in 2009 that will subject the emission of CO₂ by automobiles to strict limitations. Starting in 2012 and until 2015, all automobile manufacturers will be subject to a ceiling of 130 g/km per

Innovation in aramid and TPEs
In the engineering plastics and thermoplastic elastomers (TPEs) market, short aramid fibers and aramid powders are, for instance, used in gears and sleeve bearings. A small amount of aramid contributes to increased wear-resistance and mechanical strength of the product, which increases service life. The addition of aramid also helps to reduce vibration and noise.

Together with a number of customers, we are working on improving aramid as an additive to other materials. We already achieved results with improving the dosability of our short fibers (mixing of fibers in dosing), which simplifies the processing of aramid in our customer’s production. Customer feedback has led to a project aimed at the improved bonding of aramid fibers and TPEs.

We have treated aramid fibers and yarns with various types of finish for better bonds with TPE. Each finish was developed specifically for particular types of TPEs. These products have been tested among a select group of customers and in our R&D lab. The tests show significant improvement of the bonding of aramid and various TPEs.

Sustainability “downstream”
We work for industrial customers serving niche markets. If we want to encourage the sustainability of our markets, we must be realistic about our position in these markets. The market for composites consists for 99% of glass fiber composites, 0.9% of carbon composites, while the mere 0.1% that we share with our competitors is aramid.

It is an illusion to think that we can take a pioneering role in the sustainability of the chain for the entire composites market.

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car in average CO₂ emissions for all newly registered cars. In 2012 that will apply to 65% of all cars delivered by the manufacturer, and in 2015 to 100%. Every additional gram of CO₂ will be paid for through a financial penalty. That ceiling will be lowered further in 2020 to 95 g/km. These changes are a good fit with the opportunities offered by our products.

**Sustainability through recycling**

In the ballistic market we put our energy into recycling. Especially bulletproof vests can be recycled. At present, we recycle 15% of our potential recyclable sales volume, largely from soft ballistics. This volume is currently 30% of our product line. Our goal is to recycle 25% in 2012.

**Sustainability in container transportation**

There have been a number of developments in the transportation sector in recent years, and the maritime market in particular, in which the long haul movement of products to and from Asia has grown by leaps and bounds. Economic growth increased demand for shorter turn-around times: delivery must be made fast. The rising price of oil forced carriers to find cost savings. That started with reducing speeds on certain routes, resulting in decreased oil consumption and decreased CO₂ emissions. The economic crisis sped up this cost savings process, resulting in reduced capacity and reduction of maximum speeds on a growing number of routes.

A considerable part of our deliveries is made by ship. The measures adopted by the maritime carriers hit us hard. The longer travel times resulting from reduced speeds added as much as 20% additional time on some routes. The number of departures remained the same or was even cut back. This all demanded greater flexibility from our organization. The result was that our local and in-transit inventories have been increased in order to meet local demand on time, leaving us with a structural cost-increase.

R&D is about development and improvement. The direction taken by these developments and improvements are always determined within Teijin Aramid by the goal of better product characteristics, more efficient and safer processes, lower energy consumption in the process or in the use of our products, less use of raw materials, and elimination to the extent possible of undesirable substances. That is why we apply a methodology to implement projects such that as a practice we check in each phase development for any sustainability issues attached to the new process or product. These must be resolved before moving to the following phase. We will also start with eco-efficiency analyses as a means to help determine our best, most eco-efficient project portfolio. I think it is obviously our and my responsibility to assure that we leave a nice and livable world to our children.

*Jan Roos, director research & technology*
**Lighter tires, lower fuel consumption**

Tire manufacturers are most interested in the use of Twaron in tires, including for its contribution to the reduction in CO₂ emissions of passenger cars. Twaron is especially used as a reinforcement that can absorb forces. Since it has much higher strength than a comparable weight of steel, the use of Twaron will lead to lighter tires and therefore lower fuel consumption. That will put automobile manufacturers in a better position to comply with the CO₂ requirements of European legislation.

A consumer automobile tire contains on average one kilo of steel. That adds up to five kg with four tires plus one spare. Replacing this steel with Twaron will yield a savings of four kg. Twaron is approximately five times stronger than an equal weight of steel. When the CO₂ law takes effect, this savings of four kilos will yield a savings of €38 for the automobile manufacturer because of a lower or no CO₂ penalty.

The use of Twaron in tires requires expertise for the optimum use of such processing techniques as twining (twisting two or more yarns around each other into a cord) and dipping (the application of a layer of glue to the cord). We can make various twining and dipping samples with which we can support converters and customers in the manufacture of an optimum product. We can also prescreen for adhesion and fatigue (resistance to repeated loads) to improve the chance of successful practical trials. Teijin Aramid can make a larger quantity of these samples at its own facilities. This allows the customer to develop a new tire faster and with greater success.

**Twaron’s carbon footprint**

In the year under review we received the first questions from a few customers about Twaron’s carbon footprint. We found that to be a positive sign from the market: these customers are aware of the relevance of the footprint for their own products, business and, in a broader sense, for society. We realized, however, that merely giving the customer some figure would not be very helpful, and could even harbor a risk for ourselves: how will the customer interpret any figure we give?

We know that the manufacture of a material such as Twaron is energy intensive; it has a considerable carbon footprint per kilo product. But we also know that this product usually saves so much energy in its user phase that it is highly eco-efficient over its full lifecycle. Will our customer compare this footprint with that of other yarns? Does he realize that he most likely will need many fewer kilos of Twaron than he would of most other yarns? And that a comparison on a kilo basis is not realistic? What does our customer know about the three different internationally recognized ways that you can define the scope of a carbon footprint? What if it compares the Twaron footprint with that of another aramid that uses a different definition of scope? We have decided to give the customers the information they ask for, but always with an expert explanation. And we are happy to answer every question about it.
ties in the areas of the environment, recycling, availability of raw materials, energy and sustainability as early as possible in a project. This can help avoid pitfalls in the area of QHSE – such as used substances under REACH legislation. Account is also taken of other current and future legislation, both national and international.

The year 2009 marked a breakthrough for the project navigator: even if a great deal remained to do, the implementation was a fact. By the close of 2009, about one hundred employees in all locations, including Wuppertal, had been trained in its use. Nearly all project managers and steering committee members completed this project navigator training.

In 2010 the project navigator will be combined with questions about the chain. These would include raw materials, production, transportation, use, and the discard phase: all to be integrated into the project navigator. It is a living instrument that remains under development.

Project navigator expanded with QHSE navigator

The project navigator is a tool that we use to ask just the right questions in all phases of a technical or technological project, as well as to take the correct actions and to provide clarity about the documentation to be delivered. The essence of the project navigator is summarized in a one-page table. This color-coded diagram shows the departments involved in the project at the various project stages. This navigates the project team along the most efficient successful route to an end result that is optimum for the customer, too. After the completion of each phase there is a go/no go moment, at which the steering committee can decide whether the project will continue to the next phase. A QHSE navigator has been developed within the project navigator. This ensures that all safety, health, and environmental aspects are incorporated in the project on time.

One of the important documents produced in the initial and definition phase is the QHSE start-up memo, a questionnaire designed to take advantage of opportuni-

“When it comes to sustainability, I see our challenge in continuing to improve and proactively respond to market developments. Ultimately, our customers not only value our responsible purchasing practices, but also our sustainable production. This implies that we take the complete life cycle into account and consider which measures will have a positive influence on the customer’s applications. I see a clear role for purchasing and logistics supporting our CSR goals. We have already taken a few steps, including supplier declaration. But we will continue to consider the possibilities critically. CSR is becoming a more important criterion, alongside price, quality, and time-to-delivery. In fact, the issue should become so self-evident that it is fully integrated in everything we do.”

Mark Claassen, manager supply chain
6. Eco-efficiency and our environmental achievements

| Analysis improves insights and tightens goals | Our expectations | Social aspects of Eco-Efficiency Analysis |
| Eco-Efficiency Analysis for production processes | Results of the pilot | Energy legislation | Multiyear energy reduction agreements |
| REACH | Our environmental achievements | Energy consumption and energy efficiency | CSR challenge trophy for the Delfzijl plant |
| Forestation compensates for CO₂ emissions | Emissions to air | Emissions into water |
| CSR challenge trophy for Arnhem pilot plant | Water consumption | Waste | Less waste | Packaging materials |
| Recycling: opportunities and dilemmas |
Analysis improves insights and tightens goals

Teijin Aramid would like to create added value for its customers, financially, ecologically, and socially. We view that as our rationale for existence. We made considerable progress in the year under review in quantifying that added value through the Eco-Efficiency Analysis (EEA). This enables us to describe better what value arises at which point on the chain.

We want to be leaders in the aramid world in sustainability and in making our products even more sustainable. We wish to demonstrate the positive effects of our products. EEA is the tool we use to quantify and point out the value created by our products while taking the entire chain into consideration. This tool was developed by BASF and is used by other companies.

Twaron, Technora, Teijinconex, and Sulfron are all a response to the growing demand for products that are light, durable, and safe. We are the only company in the world that can offer customers four different aramid fibers. The application of EEA to the end products made from these, and to our own products, gives our customers and us a unique position and opportunity to create additional value with sustainable products, financial, ecological, and social. That is why we are moving to apply this analysis to many of our products.

Our expectations

We can demonstrate through these results that our products contribute to a better environment and have a clear added value. By demonstrating that added value in the chain, we create a strong starting position in negotiations about, for instance, the financial value that can be created with our products. Then discussions with the customer are no longer only about our costs or the price, but also about the value that our products yield.

We expect, based on Eco-Efficiency results, that we can develop more targeted sustainable products, preferably in close collaboration with our customers. The results will give us direction in the development of new markets. We have opted first to increase knowledge on this subject internally before sharing it with our customers. Discussions within the organization have yielded new and inspiring ideas for the creation of added value and growing our opportunities.

We have made external presentations on a limited scale, such as to the VNCI. These presentations showed that EEA challenges people to give more thought to possible applications of current and future products without losing sight of economic interest. Communication with customers on this topic will start in April 2010. Our expectation is that, following on to these presentations, we will be able to take on collaborative relationships with key partners in the chain.

Social aspects of Eco-Efficiency Analysis

In our previous CSR report we indicated that we would conduct a study together with Nijmegen University into expanding the EEA to include social aspects, such as child labor, working conditions, and our role in society. This study has been completed. Its conclusion is that the quantification of such social components is very complicated. Three aspects, accidents, toxicity, and land use, could be worked into the analysis. We expect that a follow-up study can be conducted in 2011.

Eco-Efficiency Analysis for production processes

We are regularly asked whether the production of aramid is also sustainable. A relatively large amount of energy is needed for the manufacture of Twaron by comparison with PA (Polyamide) and PET (polyethylene terephthalate), for example. The added value comes from the use of Twaron in the chain, that is, from the application of our products and from their recycling.

Both our production sites and R&D are hard at work to improve production processes. The EEA can also be used to evaluate these efforts. This method affords the opportunity to show a permitting entity that all ecological aspects can be expressed in a single figure. The government would then not need to assess each element separately when considering an environmental permit. The important thing is not whether you may score better or worse on particular points. On the contrary, it is an integrated approach to the entire process and resulting products. Another benefit from this analysis for our company is that it provides better...
energy. Our production costs will rise. This development will result in extra costs for a large part of the European chemical and fibers companies and therefore hurt our market position. We are subject to the risk of “carbon leakage”. This refers to companies elsewhere in the world being able to produce more cheaply and which could result, absent compensating measures, to a transfer of industries to Asia, for example. To prevent this, the EU Directorate General for Competition is working on a proposal for compensation on behalf of the European Union; every country would be able to choose independently to adopt this recommendation.

Multiyear energy reduction agreements
Teijin Aramid participated in the Energy Efficiency Benchmarking Covenant until 2009. The aim was to make energy efficiency an issue for world leaders. This looked only at our own processes, the improvement of process efficiency within Teijin Aramid.

The VNCI signed the Multiyear Agreement (MJA-3) on October 2, 2009. Teijin Aramid subscribed to this agreement for three production sites and the Research Institute. Our headquarters was not included because its energy consumption was too low.

Under the new agreement Teijin Aramid has a best efforts obligation to save an average of 2% fossil energy per year in three areas through 2020. In addition to measures aimed at process efficiency, which were also part of the earlier covenant, sustainable energy, and energy efficient product development (chain efficiency) also plays a role.

Energy efficient product development entails the assessment of energy usage across the entire lifecycle of a product, from raw materials to its disposal.

It was already obvious by mid-2009 that this agreement was coming and we organized an energy theme day with our environmental expert from Delfzijl as a kick-off for working with the MJA-3. Employees from all sites came up with opportunities for energy savings in a brainstorming session. This is important, not only in terms of the agreement, but also in order to save costs and to limit our CO2 emissions.
An Energy Efficiency Plan (EEP) was developed to monitor and deal with energy savings in a systematic way. We intend to have the first EEP approved after the summer of 2010 for all sites. We can then start implementing proposals and monitoring. We will focus for the time being on projects with a payback time of less than five years.

**REACH Registration**

Teijin Aramid sells aramid in many forms for many applications in the European market under the Twaron brand name. In order to continue doing so, the REACH legislation requires us to register our raw materials before December 1, 2010. These are the monomers Paraphenylenediamine (PPD) and terephthaloyl dichloride (TDC). In order to comply with all REACH requirements within this time frame, we and another producer of para-aramid set up two consortia in 2008: the PPD REACH Consortium and the TDC REACH Consortium. Since PPD is also used in hair dye, two companies from the cosmetics industry joined the PPD REACH Consortium in 2009. We are leading the PPD REACH Consortium and are thus responsible for compiling the technical dossier for PPD. We also reached agreement with the umbrella organization, European Chemicals Agency, that we would be the point of contact for other organizations that produce or import PPD.

**Survey study**

Both consortia undertook a great deal of work in 2009. Under REACH many characteristics of each substance must be known and also whether the substance presents a threat to humans and animals. An intensive literature survey (700 reports) revealed which data were already available at that moment and which still had to be obtained. The required laboratory study has begun and the results will be available in early 2010.

**Cost survey**

The financial picture for the coming years was developed in the last part of 2009. Some toxicological and ecotoxicological tests are quite expensive. The estimated total costs for PPD for the four members of the consortium will come out to more than €800,000. TDC is not much cheaper.

**Treatment of by-products**

In addition to monomers we are also required to register the by-products orthophenylenediamine (OPD) and hydrochloric acid (HCl) and the solvent sulfuric acid (H_2SO_4) before December 1, 2010. We are working with another producer on OPD. Since OPD is not a monomer and is used in the industry only under properly controlled circumstances, much less data is required and the costs turn out much lower. For hydrochloric acid we joined the HCl REACH consortium and the costs are spread across more companies. For sulfuric acid, we are part of the Sulfuric Acid Consortium.

**Our environmental achievements**

In the previous CSR report we presented our environmental achievements by total per ton of product. In this report we are presenting only the relative achievements per production site. The reason for this is that we first want to work out internally how we want to measure our carbon footprint and across which quantities of products do we want to spread our emissions for our environmental results. We will present this in the next report.

**Energy consumption and energy efficiency**

![Energy Consumption Graph](chart.png)

- **Total energy consumption**

  - 2005: 3,000 Tera Joule
  - 2006: 3,500 Tera Joule
  - 2007: 4,000 Tera Joule
  - 2008: 4,500 Tera Joule
  - 2009: 2,000 Tera Joule
The energy efficiency index (EEI) depicts energy consumption relative to the quantity of Twaron produced; the lower the index number, the better the energy efficiency.

### Energy efficiency index

<table>
<thead>
<tr>
<th>Index compared to 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
</tr>
<tr>
<td>EEI Delfzijl</td>
</tr>
<tr>
<td>EEI Emmen</td>
</tr>
<tr>
<td>EEI Arnhem</td>
</tr>
</tbody>
</table>

### CSR challenge trophy for the Delfzijl plant

Each Teijin Aramid site has its own CSR challenge trophy that goes to the employee or group of employees that has undertaken a successful CSR initiative. We want CSR projects to receive the extra attention such an award brings and hope this will serve to inspire others.

In April, Frank de Nobel, CSR Ambassador in Delfzijl, presented the CSR challenge trophy to Gerard-John Slump, practical instructor for the PPD plant and responsible for the process manual and operator training. He also participates in the production performance consultations in which he, together with his colleagues, tries to improve the performance of the plant.

Gerard-John has been the engine behind the implementation of more efficient processing which led to less waste, lower costs, and lower energy consumption in the PPD plant. Thanks to his perseverance, he inspired his colleagues to work more efficiently. This is an excellent fit with our CSR vision.

### Forestation compensates for CO₂ emissions

We have been setting off the CO₂ emissions of our air travel and business kilometers by planting trees in Malaysia through Trees for Travel. We have already tried several years to find a forest close to one of our production locations for this purpose, but that has proven extremely difficult in a country so densely populated as The Netherlands.

Two Teijin Aramid employees from Emmen have been working for a number of years on the lay out of a country estate in Westerbork, close to Emmen, that will be open to the public. This property is part of the local ecological core structure and also is of historic significance as site of a former Nazi Durchgangslager, a detention and transport camp.

They want to plant five hectares of trees native to the Province of Drenthe, which would compensate for the CO₂ emissions of our air and business travel for 2009. The forest would be maintained in an ecologically responsible and sustainable manner. We therefore have decided to compensate for the 2009 CO₂ emissions of our air and business kilometers through this forestation project and are already thinking about this future forest somewhat as our ‘Teijin Aramid Forest’.

For all production locations the energy efficiency index is well above our own targets – achieved in previous years – of 2% energy efficiency improvement per year starting in 2005. This was due to the sharp drop in production volume. Energy consumption was no longer optimal due to the many production starts and stops.

Emmen has an EEI of 97, a performance that was possible, among other reasons, because this plant is of modular construction and offers the option to start and stop spinning lines independently of each other. The complex chemical plant in Delfzijl does not have this option. The temporary shutdown of this plant therefore had a much more unfavorable effect on energy efficiency. Arnhem is in the same position as Delfzijl and also had its electrical system expanded considerably for the jet spun project and expansion of the regeneration pilot plant.
**Emissions to air**

For most emissions, the most significant explanation for reductions is lower production against the preceding year. Additional notes for specific items follow below.

**Tetra**

There are notes on tetra emissions in past years in a box in Chapter 3.

There was a distressing environmental incident in March whereby tetra was released into the atmosphere and into the Zeehavenkanaal. Due to careless preparations and improper application of procedures during maintenance work, the contents of a reactor vessel drained out. During the clean up, a vacuum vehicle sucked up wastewater that contained tetra. A carbon layer supposed to absorb the released tetra was quickly saturated. This resulted in a fire and a portion was released into the atmosphere. Since attention was focused primarily on limiting the atmospheric release, insufficient attention was paid to the tetra released in the wastewater. A total of 60 kg of tetra was released into the Zeehavenkanaal.

**DCM Delfzijl**

In the first quarter a carbon bed did not function properly because an incorrect type of carbon was used. This led to a good 400 kg of additional emissions. Also, the expansion of the plant starting in 2007 increased the number of diffuse emission points. We continue to devote our attention to proper maintenance to minimize these emission points.

<table>
<thead>
<tr>
<th>Atmospheric chemical emissions</th>
<th>Location</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component (&lt; 10 um) (kg)</td>
<td>Delfzijl</td>
<td>18</td>
<td>70</td>
<td>46</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Tetrachloromethane (kg)</td>
<td>Delfzijl</td>
<td>5,288</td>
<td>2,859</td>
<td>218</td>
<td>317</td>
<td>378</td>
</tr>
<tr>
<td>Aniline (kg)</td>
<td>Delfzijl</td>
<td>51</td>
<td>77</td>
<td>22</td>
<td>22</td>
<td>21</td>
</tr>
<tr>
<td>Dichloromethane (kg)</td>
<td>Delfzijl</td>
<td>681</td>
<td>371</td>
<td>765</td>
<td>1,338</td>
<td>1,624</td>
</tr>
<tr>
<td></td>
<td>Arnhem</td>
<td>12,200</td>
<td>5,600</td>
<td>6,472</td>
<td>4,431</td>
<td>1,233</td>
</tr>
<tr>
<td>Polymer (kg)</td>
<td>Delfzijl</td>
<td>881</td>
<td>239</td>
<td>796</td>
<td>664</td>
<td>2,795</td>
</tr>
<tr>
<td>Finishes (ton)</td>
<td>Emmen</td>
<td>5</td>
<td>6.1</td>
<td>6.1</td>
<td>6.1</td>
<td>4.6</td>
</tr>
<tr>
<td>Freon 22 (kg)</td>
<td>Emmen</td>
<td>3,170</td>
<td>600</td>
<td>720</td>
<td>290</td>
<td>540</td>
</tr>
<tr>
<td>Carbon dioxide (ton)</td>
<td>Delfzijl</td>
<td>18,107</td>
<td>22,651</td>
<td>24,359</td>
<td>23,355</td>
<td>16,660</td>
</tr>
<tr>
<td></td>
<td>Emmen</td>
<td>3,706</td>
<td>3,875</td>
<td>3,432</td>
<td>3,658</td>
<td>3,260</td>
</tr>
<tr>
<td></td>
<td>Arnhem</td>
<td>1,169</td>
<td>1,246</td>
<td>1,178</td>
<td>1,267</td>
<td>873</td>
</tr>
<tr>
<td>Nitrogen oxide (ton)</td>
<td>Delfzijl</td>
<td>37</td>
<td>48</td>
<td>18</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Emmen</td>
<td>1.0</td>
<td>1.3</td>
<td>1.2</td>
<td>1.4</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td>Arnhem</td>
<td>1.0</td>
<td>2.3</td>
<td>1.4</td>
<td>0.9</td>
<td>0.5</td>
</tr>
</tbody>
</table>

**DCM Arnhem**

DCM high vapor pressure is already at temperatures >150 °C. This can easily result in DCM losses. In accordance with the DCM reduction plan of 2006 we track down diffuse leakage losses through periodic measurements and repair these as quickly as possible. Making these measurements and repairing the leaks in accordance with the protocol were a significant burden for the organization, but were in fact the key to the sharply reduced DCM losses at the Arnhem production site.

In 2010 we want to complete the implementation of an on-line DCM balance in order to detect DCM losses more quickly. The target for DCM losses in 2010 is less than 1 ton even though the most important cause of DCM losses (production of Jet spun material) will increase further.

**Polymers**

The design of our polymer dryers is no longer optimum as we consider the amended emissions requirements. Unfortunately, we exceeded our permitted levels several times in 2009. Incidents included the particulate filter bags tearing open under excessively high temperatures. The temperatures are now better under control. In order to prevent this specific emissions problem, we began a study into another type of filter bag and try to limit emissions through better preventive maintenance.
**Freon 22**
The emission of Freon 22 from leaks in the oldest chiller is nearly twice as high as in 2008. This chiller was used to cool glycol water and was removed from service in September. The new chiller will use ammonia as its coolant.

An environmental incident occurred in October during maintenance in which approximately 44 kg Freon R407C that escaped from a chiller unit were discharged into the atmosphere.

**Carbon dioxide**

**CO₂ emissions**

<table>
<thead>
<tr>
<th>Tons (x 1,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
</tr>
</tbody>
</table>

**CO₂ emissions per ton product**

Index compared to 2005

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>130</td>
<td>120</td>
<td>110</td>
<td>100</td>
<td>90</td>
</tr>
</tbody>
</table>

Product volume in Delfzijl is the same as that in 2005. The CO₂ emissions per ton are 7% lower than in the base year.

The CO₂ emissions in Emmen are directly related to natural gas consumption by the evaporator. Due to lower production less sulfuric acid needed to be evaporated, so natural gas consumption and absolute CO₂ emissions were lower than in 2008.

For our production locations in Emmen and Arnhem the CO₂ emissions per ton are much less favorable. In Arnhem the increase in CO₂ is due nearly entirely to an expansion of activities in the pilot plant, which is relatively more energy-intensive; these included a higher production of jet spun pulp and test runs for R&D.

**Nitrogen oxide**

**NOX emissions**

<table>
<thead>
<tr>
<th>Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
</tr>
<tr>
<td>60</td>
</tr>
</tbody>
</table>

The largest emitter of NOX is our Delfzijl production site. In 2008 we cited Delfzijl, not only for our direct emission of NOX but also the NOX released from the combustion of PPD heavy ends (PPD HE) outside our grounds. Viewed through the chain, we are also responsible for these emissions, even if they are not released on our own site.

In 2009 only 827 tons of PPD HE were incinerated versus 1,876 tons in 2008. This was due to both lower production and increased efficiency.

When we use the same factor to calculate NOX released through external combustion as in the previous year (5 tons), we come up with 2.2 tons of NOX. The calculation for the previous year, however, was based on an old incinerator for the PPD, which had a relatively high NOX emission per ton of waste. We have stopped using that incinerator.

We now incinerate PPD HE internally using an incinerator in which NOX emissions are lower by a factor of four. The emissions requirements for NOX from our external incinerator are lower by a factor of three (larger scale is subject to stricter emissions requirements). The amount of NOX released from external combustion is now 1.0 kg ton NOX. NOX emissions have been cut by a good 70% relative to 2005.
In Arnhem the emission of NMP was calculated for the first time in 2008 using the mass balancing method. This compares what we purchased and what is stored during the production process. Of the 60 tons in 2008, 49 tons from the pilot plant are available for polymerization. The emissions from this pilot plant were neither measured nor reported in the years prior to 2008. The remaining 11 tons are therefore comparable to the emissions for preceding years. A third party also breaks down Arnhem’s emissions biologically so that discharge to open water is zero.

**Emissions into water**

**Chemical oxygen consumption (COC)**

In Arnhem the increase in COC is related to NMP losses: see below. The sharp drop in COC in Delfzijl was achieved by commissioning a water purifier for salt wastewater.

**Total nitrogen**

We began in October 2008 with pumping part of the wastewater from the TDC and PPD plant in Delfzijl to North Water’s biological saltwater purifier. We were able to increase this in 2009 by sending more wastewater to this purification plant. Under the Pollution of Surface Waters Act, this is no longer considered a direct discharge. As a result, the emission of total nitrogen dropped by nearly 90% by comparison with 2008. The discharge of nitrogen into surface waters in Emmen is negligible due to the presence of a wastewater purification installation.

**Sulfate**

The combination of lower production and slightly improved sulfate removal in the sulfate removal installation versus 2008 explains the lower sulfate discharge.

**N-Methylpyrrolidone (NMP)**

The difference between Delfzijl’s and Arnhem’s NMP emissions is largely explained by NMP being recovered as much as possible in Delfzijl’s recovery plant for reuse in the production process. The processing path in our pilot plant in Arnhem is much simpler in design so that our solvent with NMP cannot be regenerated in the same way. It is not financially feasible to install such a recovery process there for such a small amount.

**CSR challenge trophy for Arnhem pilot plant**

In December Ernstjan Krüger, one of our CSR Ambassadors at headquarters, awarded the CSR challenge trophy to the team from the pilot plant in Arnhem. This location was able to achieve a considerable reduction in DCM emissions. Thanks to the joint efforts of technical services, production, the lab, and technology, the emissions were reduced by a factor of four relative to the preceding year.

This reduction was the result of a regular walk-about throughout the plant and fixing leaks as they were found. More results are expected since a number of technological improvements underway will further reduce the level in future years.

The DCM reduction has been an important project for us, and one that contributes to our organizational goals. Common effort within the plant achieved fantastic results. The DCM losses were cut from approximately five tons per year to about one ton per year: enormous progress.

**Emissions chemical substances into water**

<table>
<thead>
<tr>
<th>Component</th>
<th>Location</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical oxygen consumption (ton)</td>
<td>Delfzijl</td>
<td>230</td>
<td>153</td>
<td>211</td>
<td>177</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>Emmen</td>
<td>2.4</td>
<td>1.8</td>
<td>1.3</td>
<td>1.4</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>Arnhem</td>
<td>54</td>
<td>35</td>
<td>43</td>
<td>187</td>
<td>128</td>
</tr>
<tr>
<td>Total nitrogen (kg)</td>
<td>Delfzijl</td>
<td>42,249</td>
<td>59,008</td>
<td>75,386</td>
<td>63,000</td>
<td>8,288</td>
</tr>
<tr>
<td></td>
<td>Emmen</td>
<td>2,465</td>
<td>1,578</td>
<td>1,938</td>
<td>8,447</td>
<td>5,799</td>
</tr>
<tr>
<td></td>
<td>Arnhem</td>
<td>1,543</td>
<td>1,545</td>
<td>2,000</td>
<td>1,400</td>
<td>1,049</td>
</tr>
<tr>
<td>N-methylpyrrolidone (kg)</td>
<td>Delfzijl</td>
<td>17,451</td>
<td>11,259</td>
<td>13,826</td>
<td>60,272</td>
<td>41,383</td>
</tr>
<tr>
<td></td>
<td>Arnhem</td>
<td>1,65</td>
<td>161</td>
<td>171</td>
<td>193</td>
<td>120</td>
</tr>
<tr>
<td>Sulfate (ton)</td>
<td>Emmen</td>
<td>2,300</td>
<td>300</td>
<td>798</td>
<td>219</td>
<td>167</td>
</tr>
<tr>
<td>Dichloromethane (kg)</td>
<td>Arnhem</td>
<td>1,410</td>
<td>1,610</td>
<td>1,810</td>
<td>1,910</td>
<td>2,110</td>
</tr>
</tbody>
</table>
The total water consumption at the production sites was 23% less than in 2008. This, too, is a direct consequence of reduced production due to the economic crisis. However, a sharp reduction in production causes water consumption in the various processes to be less optimum.

Emmen consumes more than half of our water. Water consumption there was 16% less than in 2008. Water consumption per ton product rose by 19% over the preceding year.

Delfzijl is good for 40% of our water consumption. Water consumption there was down by nearly 30% versus 2008. Despite 30% less raw materials being produced, Delfzijl was able to keep consumption per ton product nearly equal to that in the preceding year. By comparison with previous years, however, that remains high. We will subject water consumption to thorough study in 2010.

Arnhem produced a good 40% less due to the economic crisis. This led to a drop in water consumption of nearly 35%. Water consumption per ton product rose there by 12% over the preceding year. This increase was caused by the increase in Jet spun pulp production. This production is expected to increase even more in 2010.

Waste

Our polymer was transported from Delfzijl to Emmen in large octagonal cartons (octabins) with a laminate bag. Previously, these empty boxes and their laminate bags went back to Delfzijl, where the boxes could be reused while the laminate bags were thrown away. There was always some polymer left in the bags that was also removed as waste. In 2008 that added up to 50 tons.

In the second half of 2009 this procedure was changed so that Emmen became responsible for the laminate bags while only the empty cardboard boxes were return to Delfzijl. Since we now use a different method to empty the laminate bags no polymer residues are thrown away any longer. These are now used as inputs. This change has yielded a good €100,000 in savings per year.
Packaging materials

The amount of packaging materials that we put into the Dutch market (product packaging, packaging of waste, or as waste packaging) is less than it was in 2008. Relative to base year 2005, total packaging materials are down by 70%.

The amount of packaging materials was more than 50% less than the preceding year and amounts to 42 tons. Fewer new octabins were needed for the polymer transport from Delfzijl to Emmen than in the preceding year, due in part to the production stop in Delfzijl. More used octabins were returned for reuse.

The amount of plastic waste rose slightly over 2008 and amounted to 19 tons. Metal waste was up sharply over the preceding year at 8 tons.

Recycling: opportunities and dilemmas

Opportunities

Two types of aramid material lend themselves to recycling: the unused materials and remainders of our products that are at the end of their lifecycle (such as bulletproof vests). The reuse of aramid requires a great deal of communication and coordination with the customer. The remaining materials must be checked, there could be a visit to the customer, logistics must be coordinated, and the materials must be sorted by outside parties.
Customers who deliver to us regularly benefit from our recycling service program. As soon as they have accumulated enough material they can notify us. We will then come take it away and deal with it. We will publish a recycling guide in 2010 to inform our customers about the requirements for aramid remainders and how their return shipment and payment is handled.

The market for recycled products collapsed in 2009. The recycling activities that we were just expanding were hit. We, nonetheless, accepted as much product waste as possible as a sign of commitment to our customers. We continued to develop new applications and markets for our recycled products and in the second half of 2009 developed samples of 100% aramid spun yarns for use in packings. Feedback to this was positive and we expect their first sales in 2010.

Dilemmas
In various applications, our product is so interwoven with other materials that it takes more energy to separate them than is ecologically justifiable. Aramid used as reinforcement in rubber products or in products made from engineering plastics is usually embedded in a matrix and is very difficult to separate by sorting or cutting. These methods often use relatively large amounts of energy. Methods involving chemical treatment are not recommended for financial or environmental reasons.

Recyclability is a subordinate requirement in a number of applications, such as in the ballistic market, where our product must save human life. That applies, for instance, to hardened ballistic applications, such as armor or helmets where we also face problems with separation. So we find that we must be realistic when it comes to recyclability. We make a product that does not rust, does not fall apart from water penetration, does not melt, and dissolves in almost nothing. That is the essence of application value of Twaron. That is why we find it acceptable in certain situations that, after a long life in which it saved a great deal of energy, Twaron is cleanly incinerated (thermal recycling). With EEA we can clearly demonstrate that the product is still more eco-efficient than the alternatives.

“Teijin Aramid believes in long-term, deep relations with its customers. By bundling our expertise with that of our customers, we are in a position to develop innovative, sustainable, and high technology solutions together. This is also necessary. There are limits to the availability of scarce raw materials in the world. We take our role in this quite seriously. That is why we have begun the use of the Eco-Efficiency Analysis as a permanent element of our marketing mix. I find it a challenge to develop this approach further in the coming years together with our customers. Teijin Aramid is prepared for a sustainable future, together with our customers.”

Gert Frederiks, CEO en president
7. Individual and society
Opportunities for Human Resources policy
The global financial crisis has led to declining sales, to which we have had to adjust our labor capacity. At the same time, this decision offered opportunities for a strategic plan for staffing levels. By combining these short and long term interests, we have created an advantage over our competitors.

Goals and Starting points
The mission of the Human Resources & Organization (HR&O) is ‘the development of an empowered and diverse workforce that shares the company’s core values’.

Our strategic HR&O goals are these:
• We make safety and health the highest priority.
• We want to be a first choice employer.
• We strive for a business culture in which our core values of Passion, Unity, Respect, and Excellence are nourished.
• We provide inspiring and supportive leadership.
• We excel in attracting and developing talent.
• We maintain contacts through effective communication.

We seek personal development, diversity, trust, integrity, transparency, and excellence in the formation, execution, and evaluation of our HR policy. These are important starting points for us.

Social innovation
By social innovation we mean the increase of productivity, labor participation, and pleasure in work through the development of new management skills, the use of flexible forms of organization, by working smarter, and by developing talent. Participation, flexible employment conditions, and craftsmanship are central for Teijin Aramid. Economic circumstances may have slowed dialogue on these themes but it has not brought it to a halt. Together with the CLA partners, new initiatives will be taken on that level in 2010.

Complaints Committee and confidants
Teijin Aramid has confidants and a Complaints Committee. Any complaint that is not resolved through discussion with a supervisor or confidant can be submitted to the Complaints Committee. These would be complaints about unequal treatment, harassment or bullying, or conflicts at work: situations that can prevent an employee from enjoying work in the organization. All complaints are handled in confidence under our complaints procedure. There is a confidant at each location. The Complaints Committee comprises nine employees from the three locations in the Netherlands. These people are asked to sit on the committee, some by the employer and some by the Works Council.

Project IHRIS
The IHRIS project includes the implementation of two systems: Profit (salary and personnel information) and Efficient (time recording). This project was begun in 2007. The basic registration and salary module were installed in 2008. Salaries were then paid using Profit and we then began implementing the other HR modules and the time recording system. The project will be completed in the first half of 2010. We plan to have both systems become the backbone for our social policy, with self-service by employees and supervisors, and support for all important HR processes.

Knowledge Workers Arrangement
That Teijin Aramid did not suffer only negative financial consequences from the financial crisis is evident from our participation in the Knowledge Workers Arrangement. This was launched in 2009 by the government of the Netherlands to prevent companies hit by the crisis being forced to fire highly educated employees. Knowledge workers will be detached for a term of up to eighteen months with a public knowledge institution to work on a project co-financed by the government.

Four employees from R&D are participating in the arrangement on three projects. They are detached fulltime to the TNO and TU Delft. Wim Haanstra is working at TNO on a...
GOUD improvement program

Fully in line with our PURE values, Delfzijl has begun a course of improvement bearing the acronym GOUD. This stands for the Dutch words Gezamenlijk, Ondernemend, Uitdagend, and Duurzaam: or, in English, Joint, Enterprising, Challenging, and Sustainable. The acronym is highly appropriate in Dutch as it also the word for gold, and gold also means a first place win, it is the color of our product, and, in the local Gronings dialect, ‘goud’ also means ‘good’.

The aim of GOUD is to utilize fully and develop the possibilities offered by our employees and facilities. GOUD is based on a personal mindset that comes from the following:

1. I base decisions on facts.
2. I set ambitious goals, persist, and challenge the status quo.
3. I take ownership of the work that must be done.
4. I coordinate my priorities with the greater good.
5. I have confidence in the joint achievement of our goals.
6. I take a positive attitude to change.

Sprint teams

GOUD uses sprint teams to implement short term improvements and, parallel to these, a marathon course for longer term improvements. Sprint teams are multi-disciplinary teams that are exempted from their usual tasks to work on improvement projects for eight weeks. This gives the participants, and other employees, focus, scope, and decisiveness. Projects include extraction column performance, waste reduction, reorganization of alarms, energy savings, and documents and classifications.

In 2009 the sprint teams completed seven improvement projects successfully. The TDC plant’s day-to-day production became more stable. The results of the energy sprint team produced savings of €1.2 million for 2009 and €800,000 in permanent savings. The extraction sprint team was able to achieve savings of nearly €500,000 from wastewater. Another team produced €500,000 savings from solid waste.

These were followed by a marathon to secure long-term success. This brought together representatives of production, technology, and maintenance in a results-oriented team in which these disciplines work with greater focus and efficiency.

“The collaboration with colleagues from other disciplines is greatly valued in the sprint teams and produced a great deal. This way we can release the enormous potential in the organization.”

Edith Romp, site manager Delfzijl
Many companies in the North of the Netherlands are facing the same issue: how can we ensure that an adequate number of qualified technicians with the right level of studies continues to enter the labor market? That is reason for us to undertake these measures, along with others.

Ronald de Jong, HR & Education Officer

Education and development

Employee development programs
Functional and career-oriented employee development programs have been kept in place. Employees with temporary contracts are enabled, where possible, to complete their training. Employees are also deployed into adjacent areas and can take training during production halts. The leadership program, the training program for members of the leadership team, has also been continued. This program has contributed to projects aimed at managing the consequences of the economic crisis.

Contacts with educational institutions
Contacts with educational institutions and student associations have been kept intact to the extent possible, even if with great cost-consciousness. We were present at various campus recruitment days held by universities and at national career fairs. Participation in the open days of various schools yielded interns and graduate positions for students in a number of disciplines. We also continued our collaboration with various secondary and elementary schools. A three-year agreement was signed at the end of 2009 with the Stichting Techniektoernooi/Technical Tournament Foundation, which organizes national and regional tournaments for elementary schools.

We are an active participant in the Jongeren en Technologie Netwerk Nederland / Netherlands Youth and Technology Network (Jet-Net), a collaboration among companies, education, and government. Its purpose is to interest Higher Secondary and Pre-university students in a science-oriented education. Together with other companies in the north of the country, we have organized a “College Bowl” type quiz for secondary school students and a workshop on Twaron for teachers and instructors, which were received enthusiastically.

Collective terms of employment
Teijin Aramid wants to be the preferred employer at all functional levels. To become that, its terms of employment must be better than those of comparable companies. Current themes include the shift from collective to individualized terms of employment and increasing employment flexibility. The shift from group to individual is related to the growing diversity of the labor force, including age, origin, and personal situation.

Our goal in increasing employment flexibility is to make two changes at once: a more flexible deployment of employees in response to market conditions, but also more options for employees to combine the twin demands of work and care-giving.

This change requires us all to let go of familiar arrangements and rules that set out in detail what everyone does and does not have a right to do and receive. This is being

Stimulate the influx of technicians
Ronald de Jong, HR & Education Officer at our Delfzijl production site, is part of the daily management of Stichting Support AOT Noord, the All-round Operational Technician Foundation. This foundation has the goal to bring about an adequate influx of students who will complete their diplomas in various technical disciplines in order to guarantee the continuity of the supply of labor to the technical sector. In 2009, the Foundation paid the cost of studies for approximately 50 people. This success contributed to the creation of a fifth Education Labor Market Task Force, which allocates the additional resources made available by government for a region.
In the spring, we reached agreement on guaranteed employment linked to dropping a general wage increase. We then reached agreement with the trade unions on a one-year CLA. In addition to guaranteed employment, the CLA included agreements for a one-time payment of €300 gross in January 2010 and the creation of a Workload Reduction Monitoring Committee. Employees can apply to this committee to have duties modified to fit with their physical circumstances. This modification to the CLA updates a rule that automatically linked workload reduction to age.

Development of a new pay structure
At the request of Teijin Aramid, experts from the AWVN (Dutch general employers’ association) and the trade unions worked out a proposal for a new pay structure for personnel classed as CAO1 (up to and including middle management). This new pay structure has a number of improvements and is a good fit with our organization. Salaries are competitive with the market across the line. Pay grades are also steeper so that promotion now yields more. This can encourage the further development and growth of employees. The new pay structure also recognizes broader job categories, so there will be less discussion about job classification. Finally, other differences in pay between current employees and the newly hired are also reduced.

Job classification is a sensitive topic within Teijin Aramid. Because of this, a Job Classification Monitoring Committee will be created. Whether and when the new pay structure will be implemented is a point of negotiation with the trade unions.

Sponsoring
We wish to do more than merely contribute to a better quality of life through our products. We also want to help improve residential and daily life in our immediate vicinity. We think it is important that our employees feel they can be proud of their company and its social involvement; this is an expression of Teijin Ltd’s corporate philosophy, "Enhancing the quality of life."

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“We our company profits from the basic knowledge available from TU Delft. The collaboration also promotes the building of a knowledge network in a number of areas of research.”

Ben Koenders, senior R&D medewerker
Sustainable initiatives
An important point of departure for our policy on sponsoring is sustainability. We therefore prefer long term collaboration on initiatives in which sustainability is primary. We have not earmarked a fixed percentage of our annual budget for sponsoring. We have a fixed contract with our regional symphony orchestra, Het Gelders Orkest, and with Amsterdam's Stedelijk Museum, which we support both materially and financially in conjunction with Teijin Ltd. In Arnhem and Emmen we support, among others, an organization that mediates between associations in need of assistance and companies willing to make funds, materials, man-hours, or knowledge available.

Sponsoring related to the labor market
Teijin Aramid sponsors a number of academic associations and activities in Chemical Technology and Materials Science at the universities of Delft, Groningen, Twente, and Eindhoven to increase awareness of its potential as an employer. One sponsorship aimed at the labor market is ‘Formula Student’ at TU Delft, in which students build a racecar embodying new technologies and sustainable solutions. Teijin Aramid provides financial support for this project as well as Twaron for the car’s front end so that it is better able to survive crashes. Teijin Aramid also sponsored the NUNA 5, also built at Delft University, in 2009. NUNA is a sustainable and innovative sun-powered car that participated in a bi-annual long distance race in Australia.

Christmas gifts
The employees of Teijin Aramid each year make half the value of their year-end bonus available for Christmas donations. That amount was greater in 2009 since a number of employees waived their year-end bonus. The Works Council for each Dutch location determines the recipients of the Christmas donation. In addition to the uses determined by the three locations, a joint donation is made for which employees can submit proposed recipients. In 2009 we made Christmas donations to the Ommelander hospital in Delfzijl (€3,500), to three care centers in Emmen (€10,500) and to the Manege Zonder Drempels (The Riding School without Barriers) in Bennekom (€3,500). The jointly chosen national recipient this year was the Arthritis and Rheumatism Foundation, which received a donation of €14,225.

Roparun Sponsoring
Employees participating as a team in sport events can be sponsored by Teijin Aramid, as was a team of employees participating in the Roparun. This is a continuous relay race of 273 teams who start in Paris and finish in Rotterdam. This 500 kilometer relay race raises money for foundations involved in the care of cancer patients: Stichting KiKa, the Sophia children’s hospital, and the Daniël den Hoed clinic. Teijin Aramid sponsored the team; a total of €35,500 was collected.

Hans de Geest, who accompanied the team by bicycle, said that Roparun ‘seeks to add days of life where no more will be given.’ Cancer has appeared in his family and among his acquaintances to varying degrees, he said, ‘I have the feeling that joint sports activities can make a small contribution to the quality of life that is threatened by cancer.’ His colleague Antoine van Weerden, who participated as a backup runner, has experienced how important it is for a family with a terminal cancer patient to have a good last time together. The German Ballistics sales department provided cycling helmets for cyclists and reserve cyclists. These employees will participate in the Roparun again in 2010 and Teijin Aramid will make a contribution.
“Corporate social responsibility provides a source of inspiration. That is expressed in our company philosophy, ‘Enhancing the quality of life in harmony with society’. With passion and conviction we work on products that enhance the social, environmental, and financial goals of all involved. We want to create value in solidarity with each other, with our customers, and with our suppliers. Continuously seeking opportunity and improvement by continuing to develop one’s self. I think that gives meaning to ‘Pure’ in our daily work.”

Wilfried Claus, director HR&O
# Annex 1: List of abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tr>
<td>Aramide</td>
<td>Abbreviation for ‘aromatic polyamide’; man-made high-grade fibers.</td>
</tr>
<tr>
<td>BRZO</td>
<td>Directive on Risks of Severe Accidents</td>
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<tr>
<td>CIRFS</td>
<td>European Association of man-made fibers</td>
</tr>
<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
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<tr>
<td>CSR</td>
<td>Corporate Social Responsibility</td>
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<tr>
<td>COC (CZV)</td>
<td>Chemical Oxygen Consumption</td>
</tr>
<tr>
<td>EEA</td>
<td>Eco-Efficiency Analysis</td>
</tr>
<tr>
<td>EEP</td>
<td>Energy-efficiency plan, part of MJA-3</td>
</tr>
<tr>
<td>EEI</td>
<td>Energy-efficiency Index: Energy consumption relative to the amount produced.</td>
</tr>
<tr>
<td>E&amp;I</td>
<td>Ethics &amp; Integrity</td>
</tr>
<tr>
<td>GRI</td>
<td>Global Reporting Initiative (international standard for CSR reporting)</td>
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<tr>
<td>HCPX</td>
<td>Hexachloroparaxylene</td>
</tr>
<tr>
<td>HR&amp;O</td>
<td>Human Resources &amp; Organization</td>
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<tr>
<td>Jet-Net</td>
<td>Youth and Technology Network</td>
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<tr>
<td>J-SOX</td>
<td>Japanese counterpart to the U.S. Sarbanes OXley Act</td>
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<tr>
<td>Leadership team</td>
<td>Management layer immediately below the management team</td>
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<tr>
<td>LTI</td>
<td>Lost Time Injury (incident with absence as a result)</td>
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<tr>
<td>LTI frequency rate</td>
<td>Number of LTIs per million hours worked</td>
</tr>
<tr>
<td>NMP</td>
<td>N-methylpyrrolidon (additive)</td>
</tr>
<tr>
<td>Meta-aramid</td>
<td>Name for (poly-)metaphenylene isophthalamide, brand name Teijinconex. Has excellent heat-resistance.</td>
</tr>
<tr>
<td>MJA-3</td>
<td>Multiyear agreement with the government for energy efficiency</td>
</tr>
<tr>
<td>MTC</td>
<td>Medical Treatment case (incident after which the employee can resume his duties after medical treatment)</td>
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<tr>
<td>OR</td>
<td>Works Council</td>
</tr>
<tr>
<td>Para-aramid</td>
<td>High-value aramid fiber with unique combination of characteristics for strength relative to weight. Resistant to chemicals and thermally stable. Brand names: Twaron and Technora</td>
</tr>
<tr>
<td>PPD</td>
<td>Paraphenylenediamine (basic raw material for Twaron)</td>
</tr>
<tr>
<td>PPTA</td>
<td>Polyparaphenyleneteraftal-amide (the aramid polymer)</td>
</tr>
<tr>
<td>PURE</td>
<td>Passion, Unity, Respect, Excellence (our core values)</td>
</tr>
<tr>
<td>QHSE</td>
<td>Quality, Health, Safety, Environment</td>
</tr>
<tr>
<td>REACH</td>
<td>European Regulation on the Registration, Evaluation, and Authorization of Chemicals</td>
</tr>
<tr>
<td>RWC</td>
<td>Restricted Work Case (incident after which the employee cannot resume his duties but can perform appropriate work)</td>
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<tr>
<td>TDC</td>
<td>Terephthaloyldichloride (basic raw material for Twaron)</td>
</tr>
<tr>
<td>TFA</td>
<td>Technical Fibers Application institute</td>
</tr>
<tr>
<td>TR</td>
<td>Total Recordable = LTI + RWC + MTC</td>
</tr>
<tr>
<td>TRM</td>
<td>Total Risk Management</td>
</tr>
<tr>
<td>2VA training</td>
<td>Safety First training, Teijin Aramid’s title for specific safety training</td>
</tr>
</tbody>
</table>
Teijin Aramid has taken out memberships with organizations for the sharing of knowledge and experience and to contribute to greater awareness of sustainability.

We are member of the brache organization VNCI and subscribe to the Responsible Care program. The Responsible Care program is the voluntary initiative of the international chemical industry to collaborate through national associations, such as the VNCI in the Netherlands, to improve performance in the area of health, safety, and environment. Chemical companies in 53 countries have now subscribed to the program.

Membership of the VNCI and VEMW (Association for Energy, Environment and Water) was combined starting in 2010 so that both associations can collaborate optimally to aid members.

Teijin Aramid is part of the chemicals and fibers sector. That is why we are also affiliated with CIRFS, the European Man-made Fibres Association. CIRFS represents European companies producing man-made, non-biodegradable fibers. Our membership keeps us informed about legislation and allows us to exert influence on it.

We are a member of the Dutch Polymer Institute (DPI), a collaborative of companies and universities. DPI is a Technological Top Institute that concentrates on long term research into polymers. It produces some 200 publications annually. We bring our expertise to participate in research programs into elastic polymers.

The goal of Dujat (the Dutch and Japanese Network Organization) is the strengthening of economic relations between the Netherlands and Japan. Dujat assists Dutch companies that want to do business in Japan or want to develop relations with Japanese companies. Dujat also supports Japanese companies in the development of collaboration with Dutch companies in the Netherlands and in Japan.
Annex 3:
CSR through the years

Before 2003
• Signed VNCI Responsible Care program.

2003
• Public environmental report aimed primarily at the environmental effects of production.
• We subscribe to the strategy of Teijin Ltd. and are guided for the long-term by a focus on 1. ‘The Zero Challenge’ – less waste and fewer emissions, and 2. Promote Recycling – recover raw materials from used products.
• Our goals for the next five years:
  1. Cut in half emissions of hazardous chemical substances;
  2. Improve energy efficiency by 1% per year;
  3. Cut in half the amount of industrial waste;
  4. Promote recycling.
• Creation of a code of conduct.
• € 15 million R&D-investments, equivalent to 5% of net turnover.
• Development of a recycling technique to separate Twaron from the end product (bulletproof vests).
• Development and construction of a evaporator to concentrate sulfuric acid. This allowed a considerable reduction of the purchase of sulfuric acid. The investment for this was € 6.6 million.
• Reduction in use of groundwater at the Arnhem production site of >50% achieved by developing a circulation system.

2004
• Report corporate social responsibility, which included the public environmental report.
• Creation of Board of Supervisors and appointment of commissioners.
• Start of recycling activities.
• We implement Teijin Ltd’s Green Purchasing guideline by asking our suppliers for ISO 14001 (or comparable).
• Start made in Emmen with 2VA (Safety First).
• Further reductions of up to 70% in use of groundwater (Arnhem).
• R&D research into tetra-free process and phasing out Freon22 and dichloromethane (DCM).
• Innovation managers enter dialogue with stakeholders about the role our product can play in limiting natural disasters.
• Development of the innovation award for employees with best ideas.

2005
• Report corporate social responsibility, which included the annual social report.
• Report is also broadened by describing the environmental effects throughout the lifecycle of the product.
• Report follows the GRI guidelines.
• Implemented the “leak losses” measurement protocol in January 2005. This resulted in emissions of tetra and DCM no longer being comparable with those in previous years.
• Creation of a works council (OR) for our site in Wuppertal.
• Our CSR action items for 2005 are chain management (examining each link in all chains in the production process, from purchase of raw materials through delivery of materials to the customer) and HSE accounting (sustainable performance must be concretely measurable for each link);
• The AWVN innovation trophy won.
• First collaboration with Jet-Net, a program that encourages youth to choose educational training in the chemical industry.
• Introduction of competence management.
2006
- Report has a theme for the first time: Sustainable Growth.
- Report follows the 3 P’s and is written under GRI-G3 guidelines.
- Strategic goals integrated with CSR: a new positioning strategy is formulated.
- The following mid-long term targets agreed with Teijin Ltd.:
  1. Improve energy-efficiency by 1% per year as from 2005;
  2. Emissions of chemical substances (PRTR list) must be 30% lower in 2011 than in 2005;
  3. Quantity of non-recyclable waste in 2011 must be one-half 2005’s amount;
  4. Frequency of LTIs (accidents resulting in absence) must be reduced to 0.3 (per million hours worked) in 2009.
- For the first time in six years profit is below expectations.
- Test plant for jet spinning under construction.
- Construction of recycling plant started.
- Introduction of Total Risk Management (TRM).
- First Decagon team, a group of ten promising employees, starts to sketch a vision of what Teijin Twaron will look like in 2015.
- Green Purchasing expanded with request for a ‘declaration on CSR’ from the largest suppliers.
- Compensation for air travel through Trees for Travel.

2007
- Report theme: Strength in Breadth.
- Teijin Twaron became Teijin Aramid resulting in changes to all logos, printed matter, and visuals.
- Results for second year below expectations: higher energy prices, higher raw materials prices, and low dollar exchange rate.
- Revenue and turnover reported as an index from this year for reasons of business-confidentiality.
- Labor market communication begun with campaign: ‘How will you improve the world with our product?’
- Organization-wide Ethics & Integrity program.
- Introduction of Key Performance Indicators (KPIs).
- Pilot plant for jet spinning commissioned with plan to triple capacity in 2008.
- Recycling activities begun at the end of 2007.
- Sulfron 3001 launched.

2008
- Report theme: Strength in Unity.
- R&D investments are more than € 150 million.
- CSR becomes integral part of the new strategy with a 10-year horizon.
- Received European Growth Strategy Leadership Award.
- Improvement of energy efficiency by 6% versus 2005: our ambition is raised to 2% efficiency improvement per year in place of the 1% agreed with Teijin Ltd.
- Creation of our own Ethics Committee.
- Reduction in emissions of Freon22 by 91% v. 2005.
- Started Eco-Efficiency Analysis as a pilot for Sulfron.
- Active stakeholder dialogue.
We applied the internationally recognized G3 guidelines of the Global Reporting Initiative in writing this CSR Report. The G3 has different application levels. Based on self-assessment, this report meets the conditions for the B level.

N/A not reported since this indicator did not apply to our organization
* not reported in whole or in part due to lack of systems to generate the information desired

<table>
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<th>GRI indicator</th>
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<td>Statement from the CEO on CSR vision and strategy</td>
<td>1, 19, 55</td>
</tr>
<tr>
<td>1.2</td>
<td>Description of key impacts, risks and opportunities for CSR</td>
<td>1, 4-5, 22-25</td>
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### Strategy and Analysis

- **1.1** Statement from the CEO on CSR vision and strategy: pages 1, 19, 55.
- **1.2** Description of key impacts, risks and opportunities for CSR: pages 1, 4-5, 22-25.

### Organizational Profile

- **2.1** Name of (reporting) organization: page 1.
- **2.2** Primary brands, products and/or services: pages 8, 11.
- **2.3** Operational structure of the organization: pages 12, 14.
- **2.4** Location of the headquarters: page 10.
- **2.5** Countries where the organization operates: page 10.
- **2.6** Nature of ownership and legal form: page 8, reverse.
- **2.7** Markets served: pages 8, 11.
- **2.8** Scale of the organization: pages 5, 10-11.
- **2.9** Significant changes during the reporting period regarding size, structure, and ownership: pages 12-13, 16, 18.
- **2.10** Awards received in the reporting period: page 13.

### Report Parameters

**Profile**

- **3.2** Date of most recent previous report: June 4, 2009.
- **3.3** Reporting cycle: Annual.
- **3.4** Contact point for questions regarding the report: Colophon.

**Scope and Boundary**

- **3.5** Process for defining report content: page 2.
- **3.6** Boundary of the report: page 2.

The HR data in this report incl. TFA, since we became 100% owner. The same basis of calculation is used in the 2008 CSR report for comparison purposes.

- **3.7** Specific limitations: N/A.

- **3.8** Basis for reporting on entities that can significantly affect comparability from period to period and/or between organizations: The relative environmental performances on a total level (converted to quantity of product) are not reported in this CSR report (see page 48).

- **3.9** Techniques and bases of calculation for data measurements: page 2.

Working group, intranet, environmental reports for production locations.

- **3.10** Re-statements of information provided in earlier reports: N/A.
- **3.11** Change of scope: See 3.8.

**GRI Content Index**

- **3.12** Table identifying the location of the Standard Disclosures in the report: Table of Contents.

**Assurance**

- **3.13** External assurance of the report: page 2.
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<td>Governance structure of the organization</td>
<td>12-13</td>
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<td>4.1</td>
<td>Independence of Chair of highest governance body</td>
<td>12</td>
</tr>
<tr>
<td>4.2</td>
<td>Independence of unitary board structure</td>
<td>N/A</td>
</tr>
<tr>
<td>4.3</td>
<td>Mechanisms for shareholders and employees to provide recommendations or direction to the highest governance body</td>
<td>TA has a single shareholder within the group structure, Teijin Holdings Netherlands BV, a 100% subsidiary of Teijin Ltd. Shareholders can exert direct influence on the management of TA via Teijin Ltd., which is publicly listed in Japan. Employees have participation through the Works Council and their representative on the Supervisory Board who is appointed at the direction of the Works Council</td>
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<td>4.4</td>
<td>Compensation of senior management (linkage to social and environmental performance)</td>
<td>13</td>
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<td>4.5</td>
<td>Control of conflicts of interest</td>
<td>Any conflicts of interest are submitted to the Ethics Committee, page 23</td>
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<tr>
<td>4.6</td>
<td>Process for determining the qualifications and expertise of the members of the highest governance body</td>
<td>The candidate’s integrity is assessed through (pre-) employment screening</td>
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<td>4.7</td>
<td>Internally developed statements of mission or values, codes of conduct, and principles</td>
<td>4-5, 9</td>
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<td>4.8</td>
<td>Oversight procedures</td>
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<td>4.9</td>
<td>Processes for evaluating the highest governance body’s own performance</td>
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<td>4.10</td>
<td>Application of precautionary principle</td>
<td>13, 38, 42-43</td>
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<td>4.11</td>
<td>Externally developed initiatives which the organization endorses</td>
<td>2, 30, 39, Annex 2</td>
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<td>4.12</td>
<td>Memberships in associations and/or advocacy organizations</td>
<td>Annex 2</td>
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<td>4.13</td>
<td>List of relevant stakeholders</td>
<td>2, 4, 24, 26-27</td>
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<td>4.14</td>
<td>Identification and selection of relevant stakeholders</td>
<td>2, 5, 26</td>
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<td>4.15</td>
<td>Approaches to and frequency of stakeholder engagement</td>
<td>26-27</td>
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<td>4.16</td>
<td>Results of stakeholder dialogue and ensuing activities</td>
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**Economic aspects**

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<td>EC2</td>
<td>Financial implications, risks and opportunities due to climate change</td>
<td>40-42</td>
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<tr>
<td>EC3</td>
<td>Coverage of defined benefit plan obligations</td>
<td>TA has a guaranteed pension payment of up to € 55,000. In addition to this TA contributes through a defined contribution plan</td>
<td></td>
</tr>
<tr>
<td>EC4</td>
<td>Significant financial assistance received from government</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Market Presence</td>
<td>ECS</td>
<td>Range of ratios of standard entry level wage compared to local minimum wage</td>
<td>The minimum entry level wage at all locations (in NL) is 30% above the minimum wage in the Netherlands</td>
</tr>
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<td>EC6</td>
<td>Policy, practices, and proportion of spending on locally-based suppliers</td>
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<td>Procedures for local hiring</td>
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<td>Indirect Economic Impacts</td>
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<td>Investments in infrastructure and services primarily for public benefit</td>
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<td><strong>Environmental Aspects</strong></td>
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<td><strong>Materials</strong></td>
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<td>EN1</td>
<td>Materials used by weight or volume</td>
<td>54</td>
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<td>EN2</td>
<td>Percentage of materials used that are recycled input materials</td>
<td>*</td>
<td></td>
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<tr>
<td><strong>Energy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EN3</td>
<td>Direct energy consumption</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>EN4</td>
<td>Indirect energy consumption by source</td>
<td>See EN3</td>
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</tr>
<tr>
<td>EN5</td>
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<td>48-49</td>
<td></td>
</tr>
<tr>
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<tr>
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<td>Initiatives to reduce indirect energy consumption and reductions achieved</td>
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</tr>
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</tr>
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<td>Percentage and total volume of water recycled and reused</td>
<td>*</td>
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<td>50</td>
<td></td>
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<td>EN13</td>
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<td>N/A</td>
<td></td>
</tr>
<tr>
<td>EN14</td>
<td>Strategies, current actions, for managing impacts on biodiversity</td>
<td>*</td>
<td></td>
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<tr>
<td>EN15</td>
<td>Number of protected species with habitats in areas affected by operations</td>
<td>*</td>
<td></td>
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<td>Other relevant greenhouse gas emissions</td>
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</tr>
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<td>50-51</td>
<td></td>
</tr>
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<td>Emissions of ozone-depleting substances</td>
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<td></td>
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<td>Weight of transported or treated waste deemed hazardous</td>
<td>53-54</td>
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</tr>
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<td>EN25</td>
<td>Identity of water bodies and related habitats significantly affected by discharges of water and runoff</td>
<td>50</td>
<td></td>
</tr>
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<td></td>
<td></td>
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<td>24, 40-43, 46-47</td>
<td></td>
</tr>
<tr>
<td>EN27</td>
<td>Percentage of products sold and their packaging materials that are reclaimed</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td><strong>Compliance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EN28</td>
<td>Monetary value of significant fines for non-compliance with environmental laws and regulations</td>
<td>No fines received</td>
<td></td>
</tr>
<tr>
<td><strong>Transport</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
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<td><strong>Overall</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EN30</td>
<td>Environmental protection expenditures and investments</td>
<td>5, 24</td>
<td></td>
</tr>
<tr>
<td>GRI indicator</td>
<td>Description</td>
<td>Page / Notes</td>
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<tr>
<td><strong>Social Aspects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LA1</td>
<td>Workforce</td>
<td>5, 10</td>
<td></td>
</tr>
<tr>
<td>LA2</td>
<td>Employee turnover</td>
<td>5, 10, 18, 33, 61 Intake 38, discharge 59</td>
<td></td>
</tr>
<tr>
<td>LA3</td>
<td>Benefits provided to full-time employees that are not provided to temporary or part-time employees</td>
<td>*</td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
</tr>
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<td>5, 10</td>
<td></td>
</tr>
<tr>
<td>LA5</td>
<td>Minimum notice period(s) regarding operational changes</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td><strong>Occupational Health and Safety</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LA6</td>
<td>Percentage of total workforce represented in formal joint management-worker health and safety committees</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>LA7</td>
<td>Rates of injury, occupational diseases, lost days, and absenteeism, and total number of work-related fatalities</td>
<td>33-34 No work-related fatalities</td>
<td></td>
</tr>
<tr>
<td>LA8</td>
<td>Programs for workforce and their families regarding serious diseases</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>LA9</td>
<td>Health and safety topics covered in formal agreements with trade unions</td>
<td>60-61</td>
<td></td>
</tr>
<tr>
<td><strong>Training and Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LA10</td>
<td>Average hours of training per year per employee</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>LA11</td>
<td>Programs for skills management and lifelong learning</td>
<td>9, 60</td>
<td></td>
</tr>
<tr>
<td>LA12</td>
<td>Percentage of employees receiving regular performance and career development reviews</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td><strong>Diversity and Equal Opportunity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LA13</td>
<td>Composition of governance bodies</td>
<td>5, 33 11% of permanent workforce has a non-Netherlands nationality</td>
<td></td>
</tr>
<tr>
<td>LA14</td>
<td>Ratio of basic salary of men to women</td>
<td>Women and men with equal work experience, level and potential are paid equally</td>
<td></td>
</tr>
<tr>
<td><strong>Human Rights</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HR1</td>
<td>Percentage and total number of significant investment agreements that include human rights clauses or that have undergone human rights screening</td>
<td>A good 60% of procurement volume is purchased centrally. This covers about 45% of all suppliers. Of this group the percentage of screened suppliers is given on page 39</td>
<td></td>
</tr>
<tr>
<td>HR2</td>
<td>Percentage of significant suppliers and contractors that have undergone screening on human rights and actions taken</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>HR3</td>
<td>Total hours of employee training on policies and procedures concerning aspects of human rights that are relevant to operations</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td><strong>Non-discrimination</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HR4</td>
<td>Total number of incidents of discrimination and actions taken</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td><strong>Freedom of Association and Collective Bargaining</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HR5</td>
<td>Operations identified in which the right to exercise freedom of association and collective bargaining may be at significant risk, and actions taken to support these rights</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td><strong>Child Labor</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HR6</td>
<td>Operations identified as having significant risk for incidents of child labor</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td><strong>Forced and Compulsory Labor</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HR7</td>
<td>Operations identified as having significant risk for incidents of forced or compulsory labor</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>GRI indicator</td>
<td>Description</td>
<td>Page / Notes</td>
<td></td>
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</tr>
<tr>
<td>HR8</td>
<td>Security Practices</td>
<td>Percentage of security personnel trained in the organization’s policies or procedures concerning aspects of human rights that are relevant to operations</td>
<td>*</td>
</tr>
<tr>
<td>HR9</td>
<td>Indigenous Rights</td>
<td>Total number of incidents of violations involving rights of indigenous people</td>
<td>*</td>
</tr>
<tr>
<td>SO1</td>
<td>Community</td>
<td>Nature, scope, and effectiveness of any programs and practices that assess and manage the impacts of operations on communities</td>
<td>*</td>
</tr>
<tr>
<td>SO2</td>
<td>Corruption</td>
<td>Percentage of business units analyzed for risks related to corruption</td>
<td>Corruption-related risks were taken up in the TRM sessions</td>
</tr>
<tr>
<td>SO3</td>
<td>Percentage of employees trained in organization’s anti-corruption policies and procedures</td>
<td>All employees must adhere to our code of conduct</td>
<td></td>
</tr>
<tr>
<td>SO4</td>
<td>Actions taken in response to incidents of corruption</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>SO5</td>
<td>Public Policy</td>
<td>Public policy positions and participation in public policy development and lobbying</td>
<td>TA is member of various organizations, including industry associations, which represent our industry’s collective interests</td>
</tr>
<tr>
<td>SO6</td>
<td>Financial and in-kind contributions to political parties and politicians</td>
<td>No contributions</td>
<td></td>
</tr>
<tr>
<td>SO7</td>
<td>Anti-competitive Behavior</td>
<td>Number of legal actions for anti-competitive behavior</td>
<td>None</td>
</tr>
<tr>
<td>SO8</td>
<td>Compliance</td>
<td>Monetary value of significant fines for non-compliance with laws and regulations</td>
<td>*</td>
</tr>
<tr>
<td>PR1</td>
<td>Customer Health and Safety</td>
<td>Assessment of impacts of products and services on health and safety</td>
<td>43</td>
</tr>
<tr>
<td>PR2</td>
<td>Total number of incidents of non-compliance with regulations and voluntary codes concerning health and safety impacts of products and services</td>
<td>*</td>
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</tr>
<tr>
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<td>Products and service information required by procedures</td>
<td>48</td>
</tr>
<tr>
<td>PR4</td>
<td>Total number of incidents of non-compliance with regulations and voluntary codes concerning product and service information and labeling</td>
<td>*</td>
<td></td>
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<td>61-62</td>
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<tr>
<td>PR7</td>
<td>Total number of incidents of non-compliance with regulations and voluntary codes concerning marketing communications</td>
<td>None</td>
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</tr>
<tr>
<td>PR8</td>
<td>Customer Privacy</td>
<td>Total number of substantiated complaints regarding breaches of customer privacy</td>
<td>None</td>
</tr>
<tr>
<td>PR9</td>
<td>Compliance</td>
<td>Monetary value of significant fines for non-compliance with laws and regulations concerning the provision and use of products and services</td>
<td>None</td>
</tr>
</tbody>
</table>
Colophon

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