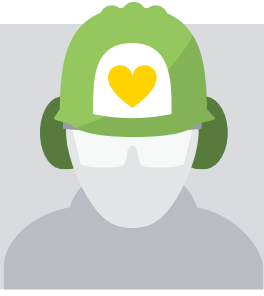




HSE Report 2014

Welcome to the Teijin Aramid Health, Safety and Environment (HSE) Report 2014. In 2014, we continued to make valuable products for our customers at affordable, competitive prices, while guaranteeing the quality of our products, work safety, and compliance with regulations. Our continuous improvement program, KenZen, helps us to achieve this. KenZen focuses on working smarter; making better use of our possibilities and focusing on the needs of our customer. An example of this way of working is our current way of reporting.

Because we are part of Teijin Ltd, our performance in terms of corporate social responsibility is reflected in the **Teijin Group CSR Report 2014**. However, we also want to be transparent on our own impact. We therefore present our HSE Report 2014, in which we focus on the key areas of health and safety, as well as on our environmental performance.



Health and Safety

Health and safety are two key areas in our ambition. Our vision with regard to these areas has been included in our

QHSE policy and complies with the policies of Teijin Ltd. Our health and safety key data are summarized below.

Teijin Aramid Health and safety performance at a glance	2014	2013
Health and safety		
LTI (Teijin Aramid)	4	3
LTI total - including contractor	5	4
LTI frequency rate	2	1.5
Total recordable	22	25

Health

The health of our employees is of key importance to us. In order to help our employees improve their lifestyle, we started our "lifestyle programs" in 2013. Employees can voluntarily participate in online programs, which help them to improve their personal lifestyle and health. These programs have been well received, and which is why they were continued in 2014. In total, 175 employees participated, and together they lost about 900kg.

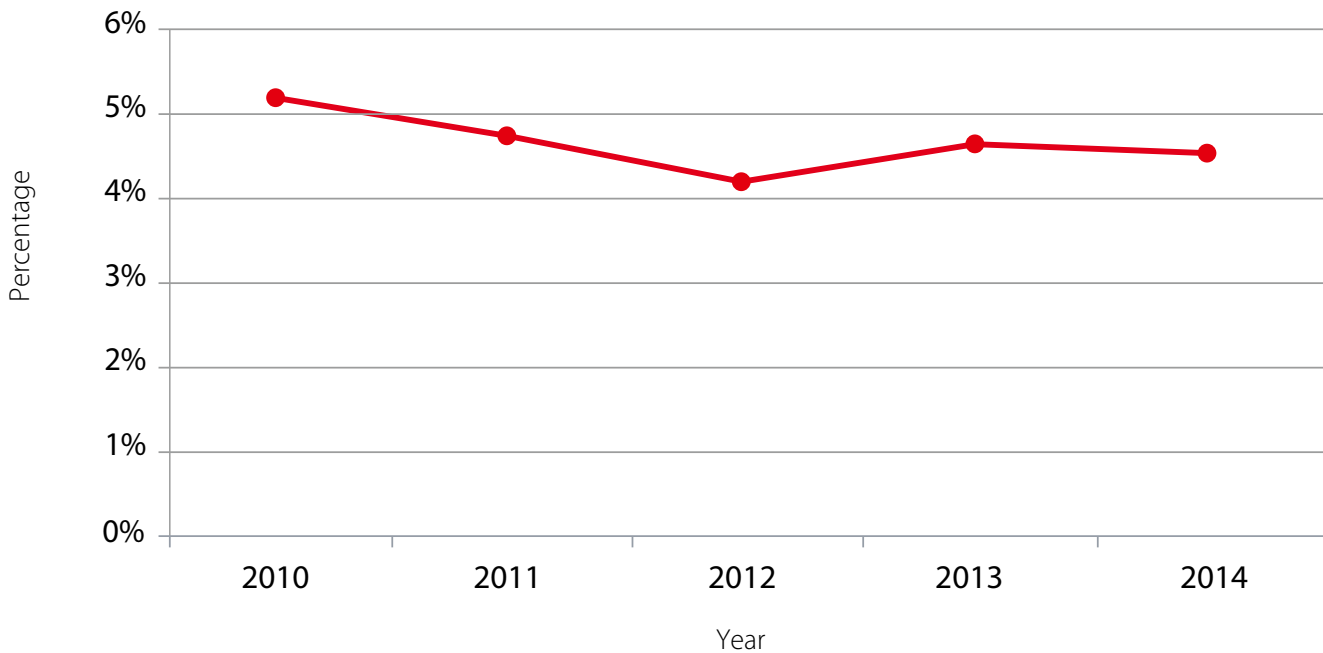
In 2014, we also offered employees the opportunity to participate in a preventive medical examination. The examination

focused both on the existing risks of the workplace and on individual employees' lifestyle, sustainable employability, and vitality.

A key parameter is our absence due to illness rate, which was 4.4% in 2014. This falls within our normal range of operation. We aim to stay below an illness rate of 4.5%.

The figures below show the health-related absences over the past years.

Health related absences



Safety

Safety is another important area for us to work on. We want our employees and contract-workers to return home from work safely every day. In line with our continuous improvement strategy, we again paid much attention to further improving safety in 2014. We want to be among the best in class in HSE performance, and we are aware that one of the items we must focus on is behavioral change throughout the company. In this context, we implemented our Life Saving Rules and launched an integrated process safety management program, which combines both technical and cultural aspects of safety.

Life Saving Rules

Following the example of the industry leaders, we developed Life Saving Rules. We started with the implementation in 2014. Our Life Saving Rules are based on our accident statistics and knowledge of relevant risks. An important step in the implementation has been to train all employees within the company. In order to do so, we follow the “train the trainer” methodology. In total, 150 managers have now been trained, and they in their turn will train their employees. The training of all employees will be finalized in the first quarter of 2015. We also included an interactive approach, with everyone playing the online game Saving the Life of the President, an innovative way for us to bring rules and decisions to people’s attention. In addition, all contractors and suppliers were informed about the Life Saving Rules.

Safety incidents

Despite all our efforts, hazardous situations still occur and incidents happen. We do our utmost to improve this, as we believe that any incident is one too many. We measure our safety performance on the basis of the following data:

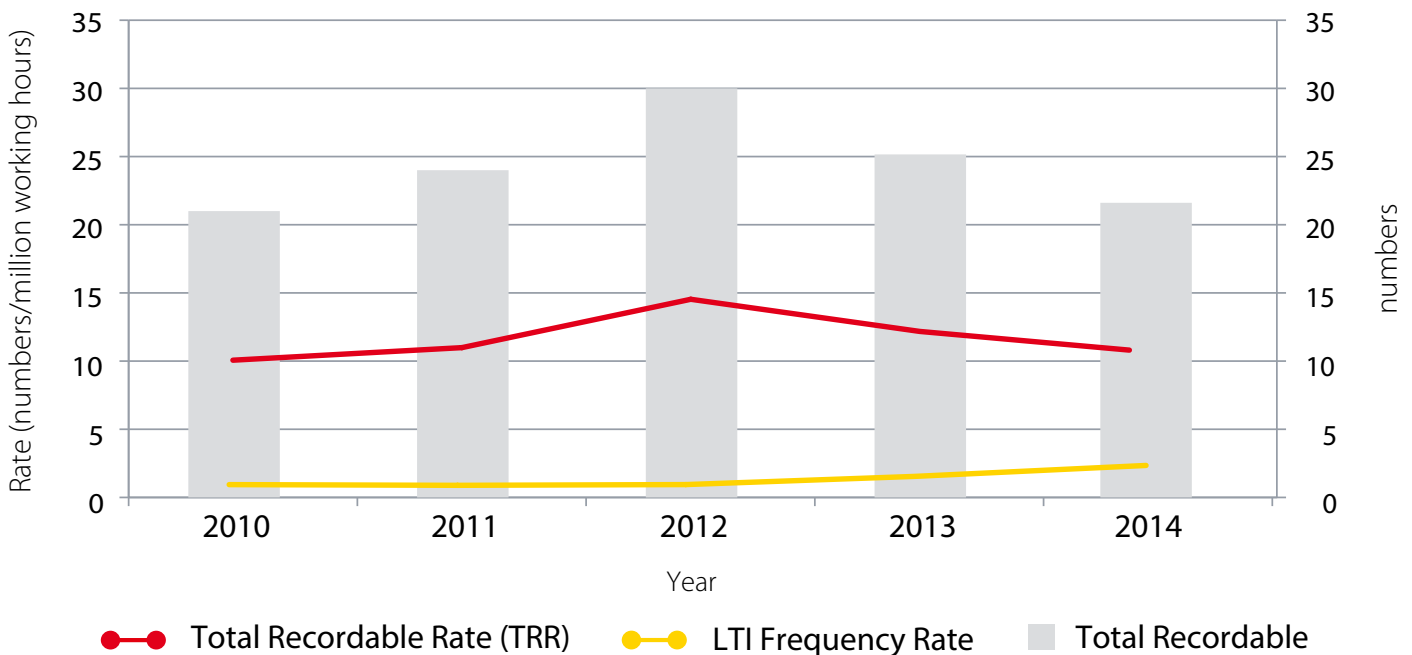
- Incidents leading to absence (Lost Time Injuries)
- Incidents leading to temporary alternative work (Restricted Work Cases)
- Incidents requiring medical treatment (Medical Treatment Cases)

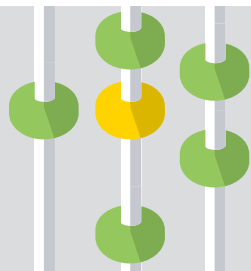
Using this information, we calculate the Total Recordable Rate (TRR), which is the total number of incidents (i.e., the total of Lost Time Injuries, Restricted Work Cases and Medical Treatment Cases) per one million working hours.

The Teijin Group had set itself a target for 2014 to maintain the Lost Time Injuries (LTI) frequency rate under 0.25 (i.e., the number of industrial accidents leading to absenteeism per one million hours worked). In 2014, we recorded 4 LTIs, which resulted in an LTI frequency rate of 2.

We also record all incidents among the employees of our contractors and subcontractors. One contractor reported one LTI.

Safety incidents





Environment

As we are part of Teijin Ltd, we follow Teijin Ltd's strategy and policies. We therefore refer to the Teijin Group CSR report 2014. However, in the execution of this policy, we also want to be transparent about our own impact on the environment. In 2014 we took the opportunity to re-evaluate the relevant issues to report on. In determining what to report on, we used the following framework:

Policies and targets of Teijin Ltd.:

- Legislation
- GRI framework for the chemical industries – Environmental
- Our reporting history

This led to the following set of indicators:

- Energy consumption – Index
- Water consumption – Index
- Emissions to air
- Emissions to water
- Waste
- Environmental incidents
- Carbon footprint

In principle, this is not a major change compared to how we reported regarding our environmental data in previous years. In addition to re-evaluating our set of indicators, we also checked the corresponding definitions. If needed, we adjusted the way of measuring, and relevant changes will be explained per item.

Targets

Our environmental framework is mainly defined by our environmental permits and legislation. We comply with all rules and regulations, which define our goals. Meeting these goals is verified yearly by means of an internal annual review and by the local governments. In the field of energy, we have a concrete target, i.e., energy savings of 2% per year.

For various cooling media, we are looking for replacements. The cooling medium Freon 22 will be replaced by alternative cooling media, resulting in an elimination of the use of Freon 22 in 2016.

At a glance

Our environmental key data are summarized below.

Teijin Aramid Environmental performance at a glance	2014	2013
Environment		
Energy Efficiency Index - in conformity with EEP		
Index Delfzijl	92	102
Index Emmen yarn	81	87
Index Arnhem	62	95
Water consumption index (compared to 2005)		
Index Delfzijl	92	102
Index Emmen yarn	69	72
Index Emmen converting	101	98
Index Arnhem	69	89
Number of environmental incidents	21	19

Air emissions

In order to minimize and control our emissions to the air, we have various installations in place, such as filters, carbon beds, and scrubbers. We have optimized our processes as much as possible, and the current emissions can only be limited by making significant changes to either the technical process or the selection of materials.

Air emissions	Location	2010	2011	2012	2013	2014
Component (in kg)						
Polymer dust and other particulates	Delfzijl	999	884	1148	1143	1070
	Arnhem	52	17	15	8	8
Tetrachloromethane	Delfzijl	103	145	301	81	184
Aniline	Delfzijl	81	23	26	21	20
Dichloromethane	Delfzijl	1059	1609	1051	1839	894
	Arnhem	1468	1401	1000	480	0
Freon 22	Emmen	239	398	180	240	120
Freon 507	Emmen	490	49	0	245	147
Nitrogen oxide (tons)	Delfzijl	11	12	11	11	12
	Emmen	1	2	2	2	2
	Arnhem	1	1	1	1	1

Tetra

When manufacturing TDC, one of the building blocks of our aramid polymer, we use tetrachloromethane (tetra). Even though the process is basically designed to emit no tetra, there are always small emissions caused by "diffuse" sources. The higher emissions in 2014 are due to normal fluctuations of the diffuse sources. There were no incidents.

DCM

The reduction of DCM emissions in Delfzijl is the result of normal operation. The strong reduction compared to 2013 is caused by the fact that we encountered one incident in 2013. In Arnhem, our production capacity has temporarily decreased, eliminating the emission of DCM in 2014.

Emissions to water

In order to minimize and control our emissions to water, we have various installations in place, such as filters, separators, carbon beds, and strippers. Furthermore, at all our production locations, part of the production water is cleaned in (biological) purification plants prior to discharge in public waters.

In previous years, we reported on emissions directly emitted from our plants into public waters, such as the Zeehaven Kanaal in Delfzijl. Part of our production and waste water is

sent to local water purification plants to be cleaned. These water purification plants have an average cleaning efficiency of 90–95%. This means that some emissions coming from our plants are emitted into public waters via the water purification plants. We feel it is our responsibility to include these emissions in our figures and the indicated values are therefore the sum of these two types emission. This is a breach with previous years. All values are within the normal range of operation, no incidents occurred.

Emissions to water	2014		
Component (in tons)	Delfzijl	Emmen	Arnhem
Chemical Oxygen Demand (COD)	57	5.3	15
Total Nitrogen	5.1	0.5	-
N-methylpyrrolidone	1.7	-	-
Sulfate	54	226	70

Energy

Energy reduction is a strategic topic for Teijin Aramid. In the manufacturing of our products, we pay a lot of attention to ways of reducing our energy consumption, in order to limit our own impact on the environment and to save costs. Energy reduction is expressed in the reduction of energy in our manufacturing processes and energy reduction as a result of the application of Twaron. We calculate the benefits of the use of Twaron in the total value chain compared to current mainstream solutions. This “chain efficiency” is calculated in close cooperation with our customers by means of our Customer Benefit Model (CBM). For examples of our eco efficiency approach, please check our [website](#).

Energy Efficiency Plans (EEPs)

In the Netherlands, we participate in the MJA-3 (‘Meerjarenplannen’) covenant at all our locations. The MJA-3 plans (Multi-year plans) are longterm agreements between the Dutch government and companies on the effective and efficient use of energy. The objective is to achieve an average of 2% energy savings every year. The implementation of

these agreements has been defined in Energy Efficiency Plans (EEPs). We now work according to our EEPs 2013 – 2016. For this EEP period, we have defined various projects to reduce the energy consumption of our processes in our plants and research facilities. By improving energy efficiency, these projects will lead to a total of 7.5% energy savings over this period. On top of these projects, during this EEP period, we aim to achieve a total of 7.8% energy efficiency savings in the value chain due to the use of Twaron. These chain efficiency benefits are calculated by means of our CBM. Every year, our performance is reviewed internally and by the relevant authorities. The reviews of the first two years (2013 and 2014) show that we are on track to achieve the planned savings in four years’ time.

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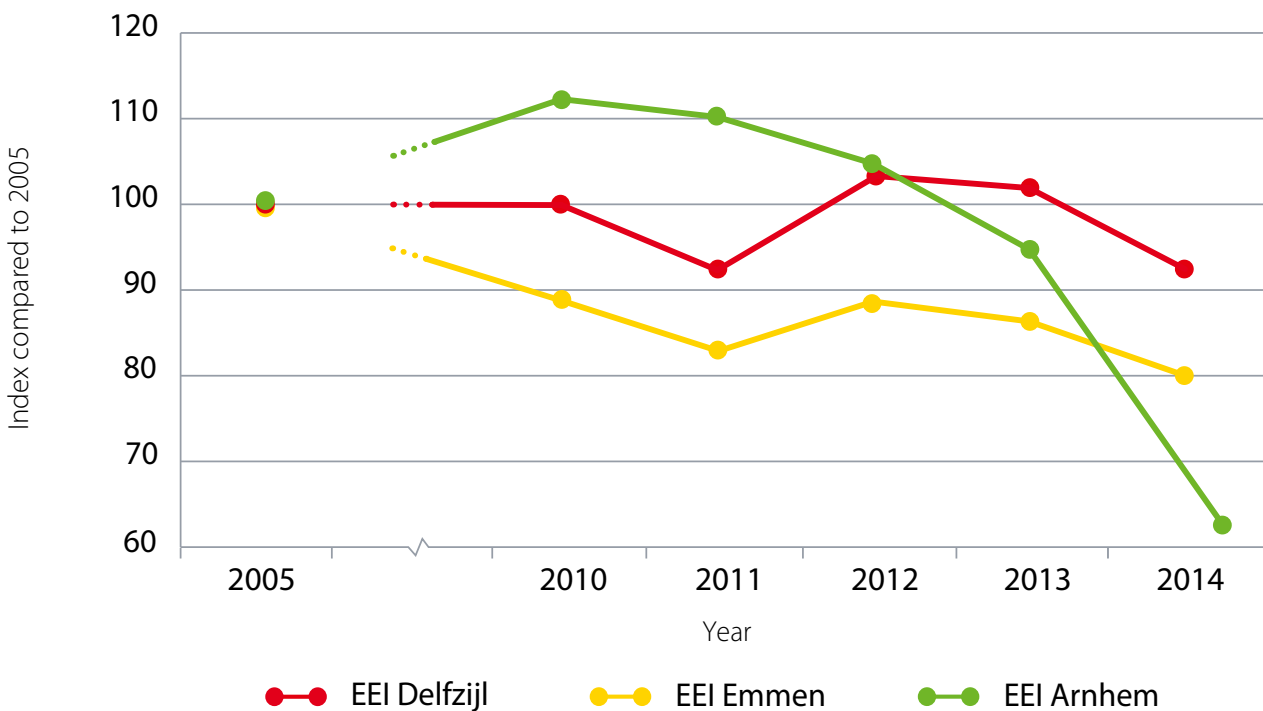
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Our energy performance in 2014

We express our energy consumption by means of the energy efficiency index (EEI). This is the total energy consumption per ton per site, compared to 2005. In the previous years, we calculated these figures ourselves. As of 2014, we will report in accordance with the EEI, as calculated by the authorities and reported in our EEPs. The EEI is still the total energy consumption per ton per site, compared to 2005. However, the EEP EEI values differ slightly, mainly due to the use of various correction factors that have been agreed upon at a national level.

In 2014, we reduced our energy consumption in our main facilities according to our plans. In Arnhem, the 2014 production levels were significantly reduced, resulting in a significant drop of the EEI. This is, of course, a positive result. However, it is not a representative picture, and we expect the EEI to increase again compared to 2014.

Energy efficiency index



Our carbon footprint

Expressing the eco-footprint of our products is an important part of our marketing strategy. By means of eco efficiency analyses and our Customer Benefit Model, we can calculate the ecological and financial impact of using Twaron in a specific application, such as the use of Twaron in hoisting ropes.

Besides adopting this application- and chain-oriented approach, in previous years, we also calculated our organizational carbon footprint: our CO₂ emission per ton PPTA produced. We have been reporting our organizational carbon footprint since 2010.

Internationally, reporting on the carbon footprint has undergone many developments that followed each other in

quick succession. For example, we see that the GHG (Green House Gas) protocol, with a specific interpretation for the chemical sector by the World Business Council for Sustainable Development (WBCSD), deals with emissions caused by scopes 1 and 2, as well as specified parts of scope 3, in ways that differ from what we do today. As Teijin Aramid aims to align with the global trends in carbon reporting, we are now in the middle of a transition to this new way of reporting.

For 2014, this means that we have not calculated our organizational footprint. We have compared all steps in our carbon footprint calculation with past calculations. This comparison has led to the conclusion that our organizational carbon footprint is comparable to that of 2013.

Waste and recycling

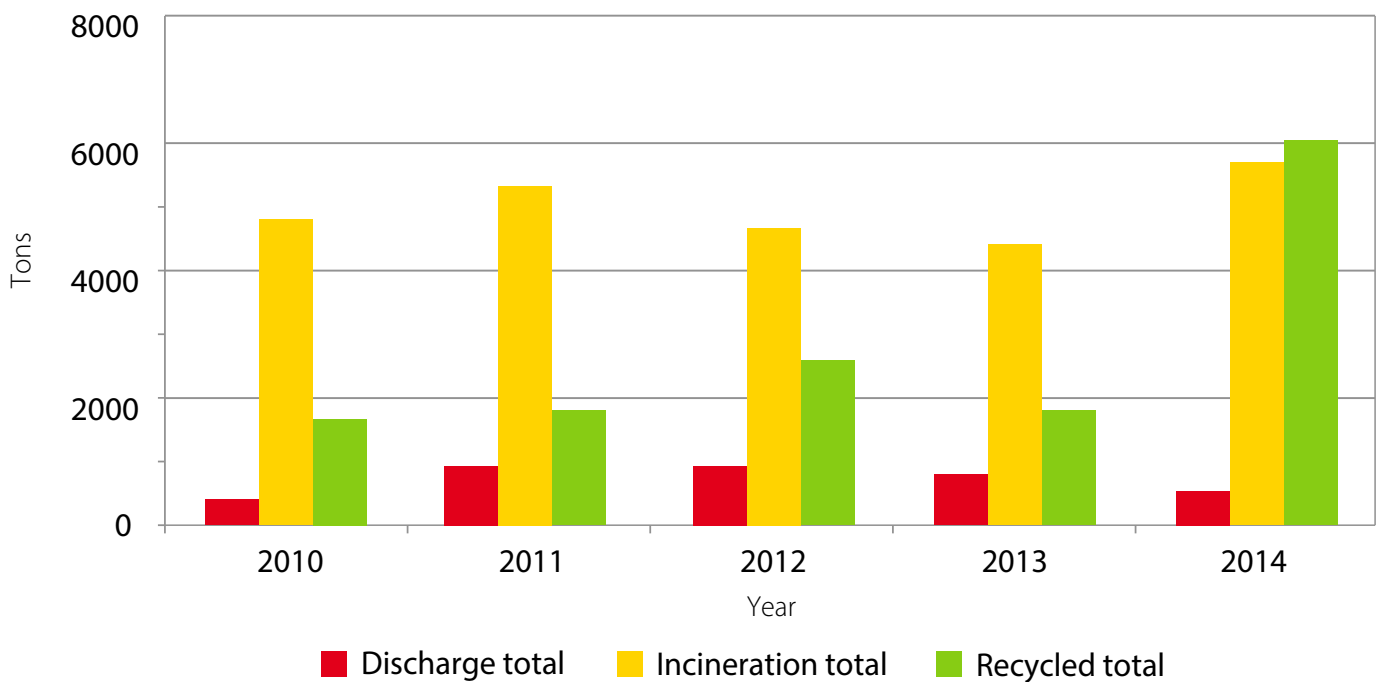
In the manufacturing of our products, we aim to recycle as much as possible within our process. However, in spite of these closed loops, all our plants still produce non-usable waste. At all our locations, this waste is either offered for recycling or sent to incinerators. Our factory in Delfzijl is the only one of our plants that also discharges part of its non-usable waste.

In 2014, the total amount of waste offered for incineration increased significantly. This is the direct result of the planned

cleaning activities of various chemical storage vessels at our Arnhem location.

The total amount of waste offered for recycling also increased compared to 2013. This increase was mainly caused by Delfzijl, as they offered approx. 2000 tons of drainage water for recycling. This was the result of an incident at one of the NMP tanks, resulting in contaminated drainage water. This water was collected and offered for cleaning at an external company.

Total waste



Water consumption

We report on our water consumption by means of the water consumption index per location. This is the water consumption per ton production, compared to our reference year 2005.

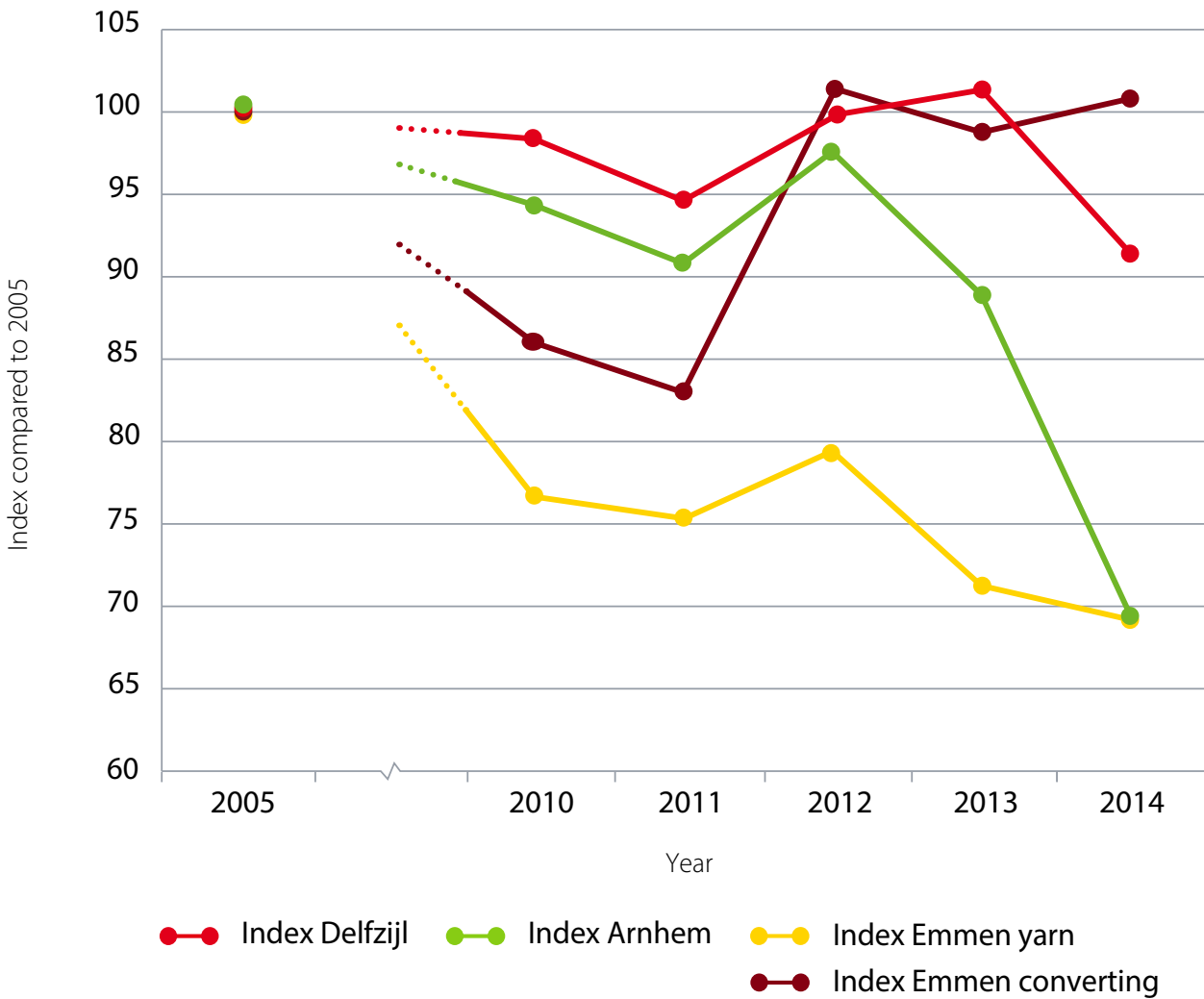
In previous years, we reported the total of all production figures for the Emmen location. However, looking at the production process, there are two main processes: the production of yarn and the converting (treatment) of this yarn.

From a water consumption point of view, these processes have a different character. The majority of the water is used in yarn production. This is a continuous process, and if possible, we aim to reduce this type of water consumption. The water consumption in the converting part strongly depends on the

products that need converting, as water is not used in all converting processes. We therefore feel it would be more representative to show both indices separately. We have corrected the values for the years 2010-2013 accordingly.

The values for Delfzijl also deviate slightly from the values presented in the past. For all locations, the current values now represent all water used in the production process coming from ground water sources or ground water suppliers. We have corrected the Delfzijl values to match this definition. The strong reduction of water consumption in Arnhem is the direct result of reduced production.

Water consumption index per ton product





For more information, please email
information@teijinaramid.com
or visit www.teijinaramid.com/sustainability