Updated Environmental Declaration

2016

STEINBEIS
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„Paper with the best values“ – the Steinbeis Papier corporate motto is absolutely perfect for an environmental declaration. But it is far more than that:

For this striking slogan demonstrates that we didn't become self-confident about the importance in our company of the harmonious interaction between quality awareness, ecological thinking and action and economic understanding only recently.

These three equal and inseparable factors stand for a common claim that is reflected in all parts of the Steinbeis Papier brand - not just in the paper itself.

Ecology and sustainability are more than just corporate objectives in our company – they form the content of the company itself.

The high technological standard and competence of our employees enable development and production processes that ensure an efficient, i.e. protective, handling of natural resources.

Our attention is given to the continual optimisation of all work processes in terms of quality, ecology and economy in order to satisfy our customers. Keeping in line with statutory requirements, we will continue to do all we can to improve “paper with the best values” and its production processes time and again.

This is our daily challenge.

Ulrich Feuersinger

Dr. Michael Hunold
**Business lines and products**

Steinbeis Papier develops and produces new paper exclusively from recycled paper:

**Coated web offset papers**

- for such applications as catalogues, magazines, advertising brochures and others
- available in two shine grades and various grammages
- The coated web offset papers have been awarded the “Blue Angel” environmental award (RAL-UZ 72) due to their environmental compatibility.

**Office papers**

- for such classical office applications as printing, faxing, pre-printing, inkjets etc.
- available in four brightness levels and various colour shades

Thanks to their environmental compatibility, the office papers have been awarded the “Blue Angel” environmental award (RAL-UZ 14). In addition, all products and the environmentally friendly production processes have been awarded the “Northern Swan”.

The paper factory also has an integrated management system covering:

- ISO 9001 Quality management
- ISO 14001 Environmental management
- EMAS EU Environmental management
- OHSAS 18001 Workplace protection management
- ISO 50001 Energy management
High-performance inkjet papers
- for high-quality mailings, brochures, magazines and book binding
- available as rolled goods in two brightness levels and different grammages.

Just like the Steinbeis office papers, the Steinbeis high-performance inkjet papers have also been awarded the RAL-UZ 14 “Blue Angel”.

The company location
The Glückstadt plant lies on the edge of the historic old town right on the port and close to the Elbe.

In 1911 Peter Gerhard Temming started operating a cotton bleaching plant alongside which paper production was gradually built up. The company’s growth and the development of Glückstadt led to the factory site directly neighbouring on urban structures. Transport links include federal road 431 for trucks, the Glückstadt outer harbour, inner harbour and a railway link.
History – Recycling paper since the 1980s

1976 Graphical recycling paper production starts

1982 Commissioning of the fully biological waste treatment plant

1984 Construction of a floor furnace to completely thermally use sewage sludge and production waste

1986 Construction of paper machine 4 (PM4) and conversion of the raw material model to 100% recycled paper
Technological development enabled the majority use of household collection

1987 Award as “environmentally-friendly business”

1991 Construction of paper machine 6 (PM6) and therefore doubling of production capacity with ongoing low waste and waste water volumes

1996 Full conclusion of production conversion to 100% recycled paper

1997 “Blue Angel” and “Nordic Swan” awards for office papers
Quality certification to DIN EN ISO 9001

1998 Market launch of currently the most modern recycling office paper with 80% white level

1999 Office papers awarded the Dutch environmental certification “Milieuveur”
2000  After 1987, the second recognition as an “environmentally friendly business”
Environmental certification to DIN EN ISO 14001 and EMAS

2002  Conversion of paper machine 4. This leads to an increase in production of 30,000 tonnes/year with the same level of waste water

2005  Construction and commissioning of recycled paper preparation plant 2
Production of recycling paper from 100% recycled paper and 90% brightness (ISO)
Construction and commissioning of an aerobic high load phase for purifying waste water

2007  Transfer of HKWG Heizkraftwerk Glückstadt GmbH into an independent company

2008  Award of the German Sustainability Prize

2009  Conversion of paper machine 4, again resulting in a further production increase by 25,000 tonnes/year

2011  OHSAS 18001 Workplace Safety/ISO 50001 Energy Management

2012  Conversion / expansion of the calender on the PM 4, such that it is now possible to produce Steinbeis Charisma Brillant.
C2C certification of all products
Joined the German Sustainability Index

2013  Expansion of paper machine PM 6;
nominated for the federal government’s CSR prize

2013  Construction and commissioning of fully automatic roller bearings
Corporate strategy


Our strategy is therefore:

1. To establish ecology in combination with maintaining high quality and consistent economical awareness as a market advantage
2. To redefine the “Paper with the best values” claim repeatedly with optimised products
3. To ensure competitiveness with a sustainable raw materials model
4. To conquer new, attractive markets with creative strategies
5. To involve employees at all levels responsibly in the decision-making processes
Unternehmenspolitik


Zum Ausbau und zur Sicherstellung der strategischen Unternehmensziele fördern und fordern wir Forschung und Produktion zur Entwicklung sowie praktischen Verwertung neuer Technologien und Prozesse. Wir suchen kontinuierlich nach neuen Wegen und Ideen in den Bereichen Qualität, Umwelt, Energie und Arbeitssicherheit, um unseren Kunden das beste derzeit mögliche Produkt bieten zu können.


Grundlage für diese Entwicklung sind unsere Mitarbeiter. Die Einbindung in die Entscheidungsprozesse auf allen Ebenen, eine bedarfsgerechte und kontinuierliche Qualifizierung und Schulung sind neben hochmodernen Arbeitsplätzen dafür eine unverzichtbare Voraussetzung.


Glückstadt, im Oktober 2014

Ulrich Feuersinger
Kfm. Geschäftsführer

Dr. Michael Hunold
Techn. Geschäftsführer
Employees identify with the corporate objectives

Steinbeis Papier has a clear objective: The company wants to offer products to its customers that ensure the highest standards in terms of environmental impact, quality and security. Predictive thinking and constantly adapting to the changing environmental conditions determine internal processes and offer a strong foundation for our standards. Our employees identify with this corporate policy and ensure competitiveness with their commitment.

Environmental protection is a matter of knowledge

Each individual employee at Steinbeis Papier knows about the importance of environmental protection and therefore also what our company is committed to. The transparency of the objectives and programmes ensures the greatest possible motivation. The quality and environmental management officer is responsible for implementing and continuously improving the company’s management system. Laying down all operational processes in written form helps to implement this system. A written policy defined by the management also forms the basis of this system. Ongoing training ensures that all company employees are aware of the current status of the management system.

Results from these training measures, the implementation level of the processes and any necessary corrective measures are monitored regularly and documented by the manager. The management receives all of the necessary information on the development of the management system in a comprehensive report. In order to respond immediately to any operational defects, clear instructions that are known to all employees are laid down. This therefore generates a complete environmental management system in which the individual departments stand side by side with equal importance - an important success factor for efficient environmental policy.
Environmental policy

Environmental committee as an elementary production factor

In parallel, an environmental committee that meets regularly has been established, which takes on a central control function. Suggestions for improvement with a specific environmental reference are also discussed and prepared here, and these include training, new legislation and statutory requirements. The environmental committee comprises the representatives appointed by the management:

• Pollution control officer
• Water protection officer
• Work safety specialist
• Management system manager
• Radiation protection officer
• Fire prevention officer
• Energy manager
• Waste officer
• Eco-audit officer
• External hazardous goods officer

In order to minimise any environmental burdens that arise during potential operational defects, a comprehensive risk defence plan has been established that is known by all employees.

Monitoring ensures standards

With fixed objectives, an environmental audit is carried out annually by those appointed to the environmental committee. This superior monitoring instance investigates on the basis of the guidelines and regulations defined by the legislator all of the environmentally relevant processes in the company and monitors the compliance of all of the measures and programmes.
There is no way to avoid recycled paper these days

The special competence of Steinbeis Papier lies in the technology and technical implementation of the material preparation of recycled paper. This results in the ongoing development of new, attractive catalogue and office papers.

The operating sites have been producing paper from recycled materials since 1976. The constantly increase in environmental awareness among the population and by corporate decision makers has made Steinbeis Papier the market leader for graphical recycled papers in Europe for years.
**The recycling process – the most natural thing in the world**

Die Produktion von Recyclingpapier teilt sich in vier Bereiche:

1. **Accepting used paper for recycling**
   
   Sorted paper is delivered in bales and in loose form via acceptance sites, classified and stored on the operating site.

2. **Recycled paper preparation**
   
   Using environmentally friendly auxiliary materials, the used paper is prepared using optimised energy and water processes, and dirt is detached mechanically. The subsequent de-inking process removes printed inks in a highly efficient manner in two successive loops.

   Each loop also has an optional chlorine-free bleaching stage to work towards the desired brightness level.

3. **Paper production**
   
   The prepared recycled paper fibres move in the next process step to paper machines 4 (office paper) and 6 (magazine paper). After mechanical dehydration, the sheets of paper are guided into steam heated cylinders and dried. Depending on the paper type it is coated or limed.

4. **Processing and dispatch**
   
   The completed recycling paper is processed as required in the devices to form rolls or formats, assembled and prepared on time for delivery.
The ecological and economic requirement

With the background of growing ecological and economic requirements, a problem-free process is essential. Therefore, all production factors within the company must be optimally matched to each other.

The aim is to ensure the ongoing process optimisation and therefore the constantly high quality level of the products. Steinbeis Papier has therefore invested double digit millions in the development and testing of new processes.

The environmental technology sets standards

Steinbeis Papier works with an overall production concept that operates to a high degree in a loop, both in terms of water supplies and energy requirements. In terms of rubbish, the focus is on avoidance. The unavoidable share is used in an environmentally friendly manner. As part of our improvement processes, we make a constant effort to further reduce noise levels. Compliance with air emission limit values is ensured by deploying the most modern technology. Requirements according to environmental law are complied with when dealing with chemicals and materials that could be a hazard to water.

Water/waste water

a) The water required for the production is covered by prepared surface water. Internally purified recycled water is used for the majority of the necessary tasks. Prepared surface water is only used where it is essential in the production process.

b) A consistent water loop with water collection by means of precipitation enables an efficient production process that protects the resources. Steinbeis Papier has developed a process by which pollutants are removed from waste water in a targeted manner.
c) Steinbeis Papier operates a fully biological treatment plant on the company’s site using which the company’s waste water is purified using the latest technology. The plant has a modern process control system. Any operational faults are immediately recognised when they occur and resolved quickly. There are automatic sampling points in the inflows and outflows of the treatment plant. The samples are analysed in the company's own lab for self-monitoring. With regard to the quality of the waste water, appropriate early warning and forecasting systems result in a high level of security. Using a sampler that works automatically around the clock in the treatment plant process, waste water can be seamlessly monitored.
Energy supply

Energy in the form of electrical power and steam is required to make paper. Although much less energy is required to produce recycling papers than when using fresh fibres, energy is an important environmental aspect and cost factor for Steinbeis Papier. To reduce the emissions resulting from energy production, Steinbeis Papier obtains its energy from a modern, external heating plant equipped with heat-power cogeneration. Secondary fuels and waste fibres from the recycling process are mainly used to provide the energy required.
## Environmental results

### Input

<table>
<thead>
<tr>
<th></th>
<th>Unit</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ground</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total area</td>
<td>m²</td>
<td>986.856</td>
<td>986.856</td>
<td>986.856</td>
<td>986.856</td>
<td>986.856</td>
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<tr>
<td>Area with buildings</td>
<td>m²</td>
<td>186.624</td>
<td>186.624</td>
<td>186.624</td>
<td>186.624</td>
<td>186.624</td>
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<tr>
<td>Area used</td>
<td>m²/t</td>
<td>0.70</td>
<td>0.68</td>
<td>0.69</td>
<td>0.64</td>
<td>0.63</td>
</tr>
<tr>
<td>Green areas</td>
<td>%</td>
<td>59</td>
<td>59</td>
<td>59</td>
<td>59</td>
<td>59</td>
</tr>
<tr>
<td><strong>Recycled goods</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recycled paper raw material</td>
<td>t</td>
<td>273.728</td>
<td>279.568</td>
<td>287.235</td>
<td>307.709</td>
<td>310.153</td>
</tr>
<tr>
<td><strong>Auxiliary materials</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Painting pigments</td>
<td>t</td>
<td>60.218</td>
<td>62.099</td>
<td>58.941</td>
<td>59.783</td>
<td>57.929</td>
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<tr>
<td>Material efficiency</td>
<td>t/t</td>
<td>1.47</td>
<td>1.45</td>
<td>1.51</td>
<td>1.48</td>
<td>1.53</td>
</tr>
<tr>
<td><strong>Energy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total fuels</td>
<td>kWh</td>
<td>–</td>
<td>–</td>
<td>2,644.762</td>
<td>2,415.540</td>
<td>2,324.305</td>
</tr>
<tr>
<td>Fuels for production</td>
<td>kWh/t</td>
<td>–</td>
<td>–</td>
<td>9.8</td>
<td>8.3</td>
<td>7.9</td>
</tr>
<tr>
<td>Electrical energy</td>
<td>kWh</td>
<td>233,846.389</td>
<td>235,023.611</td>
<td>239,930.985</td>
<td>240,773.313</td>
<td>237,490.493</td>
</tr>
<tr>
<td>Total thermal energy</td>
<td>kWh</td>
<td>396,704.722</td>
<td>390,486.111</td>
<td>391,318.718</td>
<td>364,537.174</td>
<td>366,676.583</td>
</tr>
<tr>
<td>Of which produced from gas</td>
<td>kWh</td>
<td>27,921.279</td>
<td>34,574.862</td>
<td>391,318.718</td>
<td>32,994.852</td>
<td>31,572.766</td>
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<tr>
<td>Specific total energy consumption*1</td>
<td>kWh/t</td>
<td>2.368</td>
<td>2.273</td>
<td>2.347</td>
<td>2.081*2</td>
<td>2.044</td>
</tr>
<tr>
<td>Share of renewable energies</td>
<td>%</td>
<td>31.9</td>
<td>34.3</td>
<td>34.8</td>
<td>35.7</td>
<td>34.1</td>
</tr>
<tr>
<td><strong>Water</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface (process) water</td>
<td>m³</td>
<td>2,835,792</td>
<td>2,926,514</td>
<td>2,780,317</td>
<td>2,455,825</td>
<td>2,467,871</td>
</tr>
<tr>
<td>Public network</td>
<td>m³</td>
<td>17,526</td>
<td>12,170</td>
<td>11,236</td>
<td>18,056</td>
<td>14,642</td>
</tr>
<tr>
<td>Specific water consumption for production</td>
<td>m³/t</td>
<td>10.7</td>
<td>10.6</td>
<td>10.3</td>
<td>8.4</td>
<td>8.4</td>
</tr>
</tbody>
</table>

*1 Without fuels
*2 Conversion and commissioning of PM 6
### Environmental results

#### Output

<table>
<thead>
<tr>
<th>Products</th>
<th>Total</th>
<th>Unit</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Products ready for shipment</td>
<td>t</td>
<td>266.225</td>
<td>275.238</td>
<td>268.914</td>
<td>290.930</td>
<td>295.468</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Waste for reuse of which</th>
<th>Total</th>
<th>Unit</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fibre &amp; paper sludge</td>
<td>t</td>
<td>116.305</td>
<td>119.022</td>
<td>128.178</td>
<td>135.172</td>
<td>136.697</td>
<td></td>
</tr>
<tr>
<td>Rejects and recycled papers</td>
<td>t</td>
<td>3.179</td>
<td>3.417</td>
<td>3.557</td>
<td>3.858</td>
<td>3.510</td>
<td></td>
</tr>
<tr>
<td>Commercial waste</td>
<td>t</td>
<td>705</td>
<td>1.038</td>
<td>1.563</td>
<td>1.128</td>
<td>1.040</td>
<td></td>
</tr>
<tr>
<td>Metals</td>
<td>t</td>
<td>411</td>
<td>336</td>
<td>300</td>
<td>280</td>
<td>439</td>
<td></td>
</tr>
<tr>
<td>Paper, cardboard, pressed containers</td>
<td>t</td>
<td>631</td>
<td>594</td>
<td>584</td>
<td>630</td>
<td>2.534</td>
<td></td>
</tr>
<tr>
<td>Wood, palettes</td>
<td>t</td>
<td>82</td>
<td>79</td>
<td>106</td>
<td>72</td>
<td>81</td>
<td></td>
</tr>
<tr>
<td>Other types of waste</td>
<td>t</td>
<td>132</td>
<td>156</td>
<td>222</td>
<td>134</td>
<td>183</td>
<td></td>
</tr>
<tr>
<td>Special waste for recycling</td>
<td>t/t</td>
<td>0.44</td>
<td>0.43</td>
<td>0.48</td>
<td>0.46</td>
<td>0.46</td>
<td></td>
</tr>
<tr>
<td>Hazardous waste</td>
<td>t</td>
<td>36</td>
<td>19</td>
<td>20</td>
<td>12</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Specific share of hazardous waste</td>
<td>kg/t</td>
<td>0.14</td>
<td>0.07</td>
<td>0.07</td>
<td>0.04</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>Waste for recycling approx.</td>
<td>%</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Waste for removal</td>
<td>%</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

| Waste water Waste production water | m³ | 2.287.081 | 2.503.772 | 2.280.080 | 2.301.136 | 2.373.930 |

<table>
<thead>
<tr>
<th>Waste water freight</th>
<th>CSB</th>
<th>t/d</th>
<th>1.15</th>
<th>1.20</th>
<th>1.25</th>
<th>1.39</th>
<th>1.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific CSB freight</td>
<td>kg CSB/t</td>
<td>1.41</td>
<td>1.42</td>
<td>1.49</td>
<td>1.55</td>
<td>1.56</td>
<td></td>
</tr>
<tr>
<td>BSB₃</td>
<td>t/d</td>
<td>0.064</td>
<td>0.067</td>
<td>0.069</td>
<td>0.080</td>
<td>0.090</td>
<td></td>
</tr>
<tr>
<td>AOX</td>
<td>t/d</td>
<td>0.002</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.003</td>
<td></td>
</tr>
<tr>
<td>Nitrogen anorganic</td>
<td>t/d</td>
<td>0.016</td>
<td>0.011</td>
<td>0.011</td>
<td>0.015</td>
<td>0.026</td>
<td></td>
</tr>
<tr>
<td>Phosphate total</td>
<td>t/d</td>
<td>0.002</td>
<td>0.002</td>
<td>0.002</td>
<td>0.003</td>
<td>0.003</td>
<td></td>
</tr>
</tbody>
</table>

As Steinbeis Papier does not operate its own power plant, the carbon dioxide emissions as defined by EC Directive 1221/2009 (Annex IV) do not represent a direct environmental aspect. Smaller emission sources are only insignificant when compared with production such that their level need not be stated.
In addition to the direct environmental effects, the indirect effects were also considered:

| Activity                  | Company transport                                                                 | • Purchasing products  
|                          |                                                                                   | • Purchasing electricity  
|                          |                                                                                   | • Purchasing chemicals  
| Environmental impact     | Impact from climate-relevant gases, rust and noise                                  | • Direct environmental effects  
|                          |                                                                                   | from electricity generation  
|                          |                                                                                   | (incl. climate impact)  
|                          |                                                                                   | • Direct environmental effects  
|                          |                                                                                   | of production  
| Ability to influence     | Employee information on use of public transport and support for car sharing       | Environmental impact  
|                          | Use of modern, low-pollution transport vehicles                                    | from use of detergents,  
|                          |                                                                                   | resource consumption  
|                          | Selection of suppliers, addressing environmental aspects of manufacturing,        | Selection of service  
|                          | selecting producers with an environmental management system                        | providers, compliance  
|                          |                                                                                   | with environmental  
|                          |                                                                                   | management certificates  


Using ideas and innovations, Steinbeis Papier will continue to do everything it can to give new life to the triple objectives of quality, ecology and economy. The company is aware of the constantly growing challenge in manufacturing recycled paper products and gives its employees the highest level of motivation.

<table>
<thead>
<tr>
<th>Department</th>
<th>Glückstadt plant</th>
<th>Logistics</th>
<th>AP 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality/environmental objective and measure(s)</td>
<td>Reduction in accident numbers</td>
<td>New build of an internal finished goods store for format goods</td>
<td>Saving energy and chemicals by optimising the control of flotation pumps</td>
</tr>
<tr>
<td>Kategorie</td>
<td>• Quality</td>
<td>• Environment</td>
<td>• Energy</td>
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<tr>
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</tr>
<tr>
<td>Category</td>
<td>Activity programme</td>
<td>Constructing a new finished format goods store on the plant’s site (not outsourcing format finished goods)</td>
<td>Automated control of flotation pumps in the primary and secondary loop of the AP 3 by installing frequency converters depending on the throughput volumes to be handled</td>
</tr>
<tr>
<td></td>
<td>Incl. purchasing IT-based training tool</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to quantify</td>
<td>Rate per 1000 employees of &lt; 9</td>
<td>Permanent reduction in CO₂ emissions by around 1.600 kg</td>
<td>Savings of around 115,000 kWh/a</td>
</tr>
<tr>
<td>Responsibility</td>
<td>P. Grell</td>
<td>M. Trampenau</td>
<td>K. Stange and F. Wenig</td>
</tr>
<tr>
<td>Time frame</td>
<td>up to 2017</td>
<td>up to 2018</td>
<td>up to 2017</td>
</tr>
<tr>
<td>Financial framework</td>
<td>EUR 100,000</td>
<td>EUR 5 million</td>
<td>EUR 10,000</td>
</tr>
<tr>
<td>Criterion for selection: Reference to quality/Environmental policy</td>
<td>Profitability/sustainability</td>
<td>Profitability/sustainability</td>
<td>Profitability/sustainability</td>
</tr>
</tbody>
</table>
## Quality and environmental objective programme

<table>
<thead>
<tr>
<th>Department</th>
<th>Plant</th>
<th>PM6</th>
<th>PM4</th>
<th>PM4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality/environmental objective and measure(s)</td>
<td>Noise protection</td>
<td>Reducing the average number of tears</td>
<td>Reducing the downtimes due to defective dryer fabric tensions</td>
<td>Reducing the sampling waste</td>
</tr>
<tr>
<td>Kategorie</td>
<td>• Quality</td>
<td>• Environment</td>
<td>• Energy</td>
<td>• Workplace safety</td>
</tr>
<tr>
<td>Measure</td>
<td>Department-specific measures</td>
<td>Measure planning Production</td>
<td>Measure planning Technology</td>
<td>Measure planning Production</td>
</tr>
<tr>
<td>Ability to quantify</td>
<td>Reducing the number of complaints (base 2016)</td>
<td>Average daily number of tears &lt;5</td>
<td>Halving the number of downtimes (Base 2016)</td>
<td>Halving the sampling waste (Base 2016)</td>
</tr>
<tr>
<td>Responsibility</td>
<td>Sänger, BI Mechanik &amp; Frahm</td>
<td>Denk</td>
<td>Sänger, Ketels &amp; Hennschen</td>
<td>Nahrath</td>
</tr>
<tr>
<td>Time frame</td>
<td>up to 2018</td>
<td>up to 2018</td>
<td>up to 2018</td>
<td>up to 2018</td>
</tr>
<tr>
<td>Financial framework</td>
<td>EUR 100.000</td>
<td>Internal planning</td>
<td>Internal planning</td>
<td>Internal planning</td>
</tr>
<tr>
<td>Criterion for selection: Reference to quality/Environmental policy</td>
<td>Involvement of interested groups (public / neighbours)</td>
<td>Profitability/Sustainability</td>
<td>Profitability/Sustainability</td>
<td>Profitability/Sustainability</td>
</tr>
</tbody>
</table>
Over recent years, the environmental objectives have been consistently followed and implemented:

**2002 - 2005:**

1. Reducing the use of single-use containers for process chemicals:

   Between 2001 and 2005 there was a 90% reduction for single-use containers at the Glückstadt plant (objective: 50%) by converting from single to multiple-use containers and, where possible, to tank deliveries.

<table>
<thead>
<tr>
<th>Year</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of single-use containers</td>
<td>622</td>
<td>416</td>
<td>150</td>
<td>62</td>
</tr>
</tbody>
</table>

2. Reduction in specific operating water consumption

   The objective of reducing specific water consumption by 20% could only be partially implemented. 12% savings were achieved. In detail, a reduction of 30% could be achieved for paper machine 4. Production process improvements conducted in parallel on PM 6 however resulted in a 9% increase in operating water consumption.

<table>
<thead>
<tr>
<th>Year</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS 4</td>
<td>1,15</td>
<td>1,17</td>
<td>0,99</td>
<td>0,80</td>
</tr>
<tr>
<td>PS 6</td>
<td>1,27</td>
<td>1,22</td>
<td>1,47</td>
<td>1,39</td>
</tr>
<tr>
<td>Plant 4</td>
<td>1,21</td>
<td>1,20</td>
<td>1,20</td>
<td>1,06</td>
</tr>
</tbody>
</table>

   Information on spec. water consumption: m³/100 kg production
3. New build AP 2:

With the inclusion of this quality and environmental objective, the planned objective originally set in the quality and environmental objective programme for 2004 of “reducing the remaining materials in production line 4” was raised as the recycled paper preparation system 1 was taken out of commission at the same time as constructing the new AP 2!

The environmental objectives followed with the AP 2 new build:

- Reducing the burden on the noise-critical area close to the city
- Fire prevention was improved.

Noise emissions: The 05-05-06 assessment “Measuring the noise emissions around Steinbeis Papier in Glückstadt after decommissioning the AP 1 and commissioning of the AP 2” from 25.05.2005 confirmed the reduction in noise emissions in the relevant area.

Fire prevention:

- The hall created for storing recycled paper was equipped with sprinkler protection. Recycled paper located in the outdoor store is stored in defined areas to ensure easy and problem-free access at all times.
- Hydrogen peroxide is stored in a room equipped for emergencies with a sprinkler and flooding system.
- The electric switching rooms were equipped with a pre-controlled sprinkler system.

4. Reduction in noise emissions PM 4

As a result of complaints from the population, a motor (deflaker) on the PM 4 was identified as the noise source. The initially planned encasing of the motor was stopped due to savings measures. Instead, an organisational measure was implemented to close the neighbouring hall door. This meant that the noise from the motor was kept inside the production hall. No further complaints from the population were received on this issue.
Indirect environmental effects:

The indirect environmental effects were transferred in tabular form in 2005 and assessed using the applicable ABC analysis in the same way as the direct environmental effects from the production areas.

2007:

The environmental objective set in 2006 to resolve the operational faults caused by blockages occurring on the flocker in the treatment plant by moving the rejects to the AP 3, was achieved by appropriate conversion measures. The solid elements of the rejects could be lowered by guiding the material flow over a screening board.

2008:

Online measurements and control of nutrient dosing when operated at high loads

By integrating various online measures and controlling the nutrient dosing, optimal biological nutrient supply should be achieved. After technical problems, a modified concept with a new supplier is now being followed. The objective will continue into 2010.

2009:

1. Homogenisation and improvement of the BSB degradation in the high-load phase

At the start of 2010, a TOC analyser was successfully commissioned in the feed of the biological waste water cleaning system. Using this value, which is now measured online, it is possible to adapt the nutrient dosing more quickly and precisely to the BSB₅ load. By this means, the BSB₅:N:P ratio required for a biological waste water cleaning system of approx. 100:5:1 can be better complied with. The average BSB₅ degradation at the high-load phase has been 88% since commissioning.
2. Reducing the water consumption on the PM 6

   The environmental objective was not completely achieved. A reduction in water consumption of 500 m³/d was achieved with potential for an increase.

3. Implementation of an energy recording system

   The installation of the energy recording system means that it is possible at any time to view the current energy requirements and summary plant requirements online. There is also the option of looking at the history to troubleshoot and to therefore start measures to avoid such errors.

   As the main objective, it is possible to identify individual components and derive the possible energy savings measures from these. The installed system will in future be supplemented by an additional system in order to securely document the changes in the energy used in the whole plant.

4. Calculating the savings potential for energy-saving hall lighting / changing bulbs from T8 to T5 (energy saving bulbs to fluorescent bulbs)

   The analysis of the existing lighting systems showed that the main savings potential comes from switching bulbs from HQL to fluorescent bulbs, as energy-saving bulbs offer the most economical and largest energy-saving potential. In addition, the lighting system was supplemented with an automatic switch to further increase the potential savings. Implementation started at the end of 2009 and will result in lighting energy savings of around EUR 10,000 for 2010. The measures will continue next year. The knowledge gained is already implemented when installing all new systems.

2010:

1. Heat (energy) recovery on the paper machines:

   The analysis of the energy balances showed that hall ventilation heating can be generated from the waste heat from the paper machines. The conversions on the hall air technology required to implement this objective have started but have not yet been completed. The environmental objective will therefore continue in 2012.
2. Purchase of company cars with fuel-saving transmission systems:

To implement the environmental objective, appropriate criteria (consumption and emission data as per the EU standards) were included in the assessment for the procurement guidelines. All company cars purchased since 2010 meet these requirements.

2011:

1. Environmental objective: Heat (energy) recovery on the paper machines

The necessary heating areas are to be installed in January 2013 as part of the conversion measures for paper machine 6. The environmental objective will therefore be 100% implemented.

2. Environmental objective: Reduction in accident numbers

As part of the analysis of and improvement to the safety culture, various measures were planned and implemented:

A work safety project with the title "Eyes open during production" was implemented for the employees of both paper machines. The project aimed at increasing employee sensitivity for safety-relevant issues in day-to-day operations. The "Improvement in safety behaviour" project in the recycled paper preparation came to an end and, in addition, a fork lift truck driver training course led to observation and discussion of the situation during unloading at the recycled paper area.

Across the company 20 employees took part in BG courses.

3. Environmental objective: Sludge treatment: Achieving a higher dry content

The conversion of sludge presses 3 and 4 in the treatment plant was implemented as planned in calendar weeks 37 and 38/2012. In 2012, the average dry content of the sludge before the conversion was 50.9%. After conversion, the average was around 58.9%. The environmental objective of increasing the dry content by 5% was therefore achieved.
4. Environmental objective: Reducing the noise emissions on the PM 4

In the 1st sub-step, silencers were modified and renewed as part of the conversion measures for the micro-flotation. In the 2nd step in 2013, the vacuum exhaust air was given an additional air-air heat exchanger which will lead to a further noise reduction.

2013:

1. Reduction of accident numbers at Steinbeis Papier:

In spite of the measures introduced (training on safety awareness in production), the number of notifiable accidents rose from 5 in 2011 to 8 in 2012. It was therefore not possible to achieve the objective of reducing the number of notifiable accidents. Steinbeis Energy: As part of the analysis of and improvement to safety culture, various measures were planned and implemented.

At STE the “Analyse and improve safety behaviour” project was started. The project continued in 2012 and is still ongoing. In 2012, there were no notifiable accidents at the power plant so the objective was achieved.

2. Increasing the energy efficiency by converting PM 6

As planned, the installation of a new drying hood took place as part of the comprehensive conversion of PM 6 in January 2013. This measure, combined with the higher dry content due to the new press and waste heat usage for hall heating resulted in specific steam savings of 7.8% or around 90 kWh for each tonne of paper produced. In total, this results in a saving of over 15,000 t of steam per year which means we achieved higher energy savings than the objective set in the 2012 Environmental Declaration of 9,000 t of steam per year.

3. Increasing the share of renewable energies

After the official approvals were not given, we have removed this objective from our environmental programme.
2014:

1. Reducing the CO2 emissions in logistics

Using the analysis, it was possible to assess the increase in the share of intermodal deliveries for Steinbeis Papier compared with the total number of deliveries since 2011. Since 2013, only a reduction of less than 2.0% compared with the previous years can be determined for the “share of CO2 savings in %”. This is due to the premise that Steinbeis Papier only assesses transportation for which delivery by intermodal methods is even possible or economically justifiable.

2. Sensitisation of all production employees to the current energy requirements and revealing new potential savings by installing energy monitors in the AP, PM4 and PM6 control rooms

The monitors were installed in the control rooms and the energy module modelled on the Wedge/Savcor software. Target energy consumption values should be displayed for each type and if these are exceeded this shows red in a traffic light depiction. The model is constantly optimised and adapted to new production conditions. Employees are also trained on an ongoing basis.

3. Training of additional safety assistants in the plant:

As part of the objective set, a total of 34 additional safety assistants completed their training. All safety assistants have now been stated by name on posters.

4. Increasing the energy efficiency of PM4 by extending the heat recovery

A heat exchanger was integrated into the process and it is used to heat the duo stabiliser inflow (external air) using the waste heat from the vacuum fan. Before the conversion, the duo stabiliser inflow was connected to the air hood. Connection of the heat exchanger and the switch from suction from the air hood to external air suction has a positive effect on the whole air hood.

The fact that up to 35,000 m³/h less air is pulled from the air hood means that more heated air is available for the other receivers and fresh steam can be saved. This is particularly clear for the VTP and NTP inflow. The desired potential savings were confirmed.
2015:

1. Increasing the energy efficiency of the PM 4 by extending the heat recovery

As part of this project, the hot water heating of the PM 4 was restructured and the heating recovery system further expanded.

Via a new heat exchanger, the PM's hot water is now heated via the waste heat from the opti-dry loop rather than using fresh steam.

A final assessment of the savings effect will be conducted in 2017.

2016:

1. Energy optimisation of the raw water supply from the internal harbour

The connection of raw water pumps to the process guidance system and equipping the pumps with frequency converters to appropriately control the raw water quantity was implemented successfully in 2016.

These measures achieved savings of electrical energy of around 200,000 kWh/a, thus exceeding the savings objective of 160,000 kWh/a.

The new technology also increases the safe supply of raw water at the location.
Contacts at our company

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  Tel.: 0 41 24/911-425

• Eco-officer Susanne Siebert
  Tel.: 0 41 24/911-405

We will publish the next consolidated environmental declaration at the end of 2018. We also produce an updated environmental declaration every year.