PUMA SUSTAINABILITY HANDBOOK

Environmental Standards
Foreword

At PUMA, we believe that our position as creative leader in the Sports industry gives us the opportunity and the responsibility to contribute to a better world for generations to come. With the Forever Faster transformation, Sustainability remains a key value of the PUMA brand. Faster is how we are working towards a more just and sustainable future, accelerating positive change in the industry and the world. We believe that by staying true to our values, inspiring the passion and talent of our people, working in sustainable, innovative ways, and doing our best to be Fair, Honest, Positive, and Creative, we will keep on making the products our customers love, and at the same time bring our vision of a better world a little closer every day.

We aim to bring our trading practices in line with the principles of sustainable development. This means that we do not just want to provide high-quality products, but it is our duty to ensure that these products are manufactured in workplaces where human rights are respected and workers’ health and safety as well as the environment are protected.

PUMA takes on the responsibility for everybody involved in the production process, whether a PUMA employee or not. However, this responsibility cannot replace nor substitute the responsibility of our vendors within their own manufacturing facilities. Our “Code of Conduct” expresses the expectations we have of our vendors. It is integrated into our manufacturing agreement, which delimits the business relationship we share with our partners. PUMA takes this shared responsibility seriously. We reserve the right to terminate business relations with any partner who does not respect the letter or the spirit of our Code of Conduct or Corporate Sustainability Policies.

Only by partnering up with our vendors we will be able to have a positive impact and contribute to making a better world for the communities we operate in, the workers who make our great products, our customers and our own employees and, of course, for future generations.

Lars Sørensen
Chief Operating Officer

Michael Bennett
Global Director, SourceCo
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Introduction

The protection of the environment, in accordance with established environmental and social standards has become an important topic in every industry, as well as in society in general. As a signatory of the United Nations Global Compact, PUMA is committed to setting an example on reducing the impact on the environment, both from own entities and within the supply chain, as well as, product usage and end of life. PUMA requires that all our suppliers worldwide fulfil established environmental and social standards.

While continuously optimizing the production process, PUMA also sets targets to reduce our environmental footprint and mitigate negative impacts to the world’s ecosystem of our supply chain. PUMA’s comprehensive and ambitious targets to reduce our environmental impact and become more sustainable can be encompassed in the PUMA 10FOR20 Sustainability Targets, which are inspired by the United Nations Sustainable Development Goals and aligned with PUMAs majority shareholder, Kering.

It is the responsibility of our vendors to ensure that all minimum legal requirements concerning labour, worker health & safety, environment and product safety are fully complied with. However, our standards may exceed the legal requirements of the national laws of the countries. These standards are explained in the “PUMA Sustainability Handbooks”. Our guidelines for sustainability and environmental protection are contained in the handbook “Environmental Standards”, the guidelines for Chemicals and Restricted Substances are explained in the handbook “Chemical Management”, and finally the handbooks “Social Standards” and “Occupational Health & Safety” elaborate in detail PUMA’s position on labour and health and safety.

These four handbooks are subject to continuous updates, so suggestions and comments to improve are welcome.

PUMA pursues contractual relationships with licensees and factories that have agreed to comply with the guidelines set out in the PUMA Sustainability Handbooks. All PUMA factories are contractually bound to pursue only business relationships with subcontractors that are in compliance with these established guidelines and directives.

In this handbook, PUMA presents the environmental sustainability targets for 2020 and also the implementing policies and procedures on how we plan to achieve those targets. Taking into account our learnings from the E P&L, the Human Rights Gap Analysis and our continuous stakeholder dialogue, we are also setting a strong focus on sourcing significant volumes of more sustainable raw materials.

Legal Disclaimer:

The content of this handbook is not meant to replace local or national regulations, nor will following the handbook guarantee all regulations are complied with. It remains the sole responsibility of our own entities, vendors and their subcontractors to ensure compliance with all local and national regulations at all times.
SECTION ONE
Mission Statement & Environment Policy

1.1 Mission Statement

PUMA’s mission is to be the fastest sports brand in the world. Faster is how PUMA will work towards a more just and sustainable future, accelerating positive change in the industry and the world. PUMA considers the best interest and welfare of the workers who make PUMA products, the consumer and general public who uses our products and the environment that provides the resources to make our products. PUMA aims to do this while striving to make our business profitable in order to continuously provide the best benefits for all of our stakeholders.

1.2 Sustainability Strategy

In line with our “Forever Faster” transformation, PUMA has refined its global sustainability strategy that balance three dimensions economic, social and environmental performance (Figure 1) to achieve sustainable business development. The new strategy includes a drive to mainstream sustainability, create positive impact and ensure industry alignment.

Figure 1: Three dimensions of Sustainability

1.3 Environmental Policy

We recognize that the protection of the environment is an on-going process and challenge. In our aim to carry out more sustainable activities we strive to effectively comply with local and international environmental legislations, be transparent to our stakeholders regarding the environmental impact, and to continuously improve our performance. Our environmental policy applies to all of our branches worldwide and we request our suppliers and service providers to adopt the same principles. The key points of our policy are:

- **Ensure Compliance to all Legal Regulations and set Standards that go beyond Legal Requirements**

  Enforcing the highest environmental standards, both at the PUMA and our business partner levels, benefits PUMA economically by avoiding the risks associated with illegal non-compliance, being prepared in time for any new regulations and by maintaining a good practice position to generate a positive momentum on environmental issues within the company and our stakeholders.

- **Fully integrate the Environmental Policy into the Corporate Strategy and align with Key Stakeholders**

  Sustainability cannot be achieved by an individual department or brand alone, it requires all the individuals and stakeholders involved to serve a common goal.

- **Find Win-Win Solutions for both Financial and Environmental Interests**
We are convinced that in the long term our reduction targets on CO₂, energy, water and waste, will generate financial savings through reducing resources’ consumption. Our efforts will also help to keep PUMA staff and consumers loyal and to generate new consumers while reducing PUMA SE’s impact on the environment.

- **Communicate the Environmental Policy to different levels of PUMA Organization and main Stakeholders**

After setting our standards, we aim to effectively communicate its content to all PUMA employees and workers, in order to, raise awareness and enlist support in improving our environmental performance within all divisions of PUMA SE, our business partners and consumers.

- **Strive for Continuous Improvement**

We strive to undertake more sustainable activities and produce our products in more sustainable way by continuously monitoring our performance against established targets.

We have established specific enforceable actions to reduce and prevent our environmental impact. The targets we pursue to achieve include the following:

- Meet or exceed all the environmental legislation that governs us
- Track, calculate and reduce the environmental impact generated by our activities
- Zero discharge of hazardous chemicals by 2020
- Support a maximum two degrees increase scenario on climate change by
  - Using energy as efficiently as possible,
  - Switching to renewable energy sources where economically feasible
  - Offsetting emissions from own entities that cannot be avoided
  - Supporting our suppliers in reducing their own greenhouse gas emissions
- Conserve, reuse and recycle water through good practice waste water treatment systems as well as the promotion of water recycling and rain water harvesting
- Minimize waste, promote re-usage and recycling
- Purchase leather from certified tanneries, promote tracing of leather
- Purchase paper and cardboard from certified sustainably managed sources
- Promote the usage of more sustainable cotton and polyester at scale
- Prefer environmentally friendly products and services for own purchasing decisions
- Actively support industry initiatives that promote a more sustainable apparel and footwear industry

### 1.4 PUMA Policy against the Use of Exotic Skins, Feathers and Mulesed Wool

With this policy we, PUMA SE, declare that we do not source or process raw materials from any endangered species as being defined by the International Union for Conservation of Nature, IUCN. Our policy also prohibits using leathers, hides and/or skins from animals that have been treated inhumanely. PUMA does not distinguish whether these animals are wild or farmed. In addition, PUMA SE, does and will not use any animal fur in its products globally.

In particular the following listed items are not being used:

- Furs, hides or skins from exotic animals like crocodiles, snakes, ostrich or fish
- Downs and feathers that are plucked from living geese or birds
• Merino wool from sources where mulesing practices are still applied, regardless of the country of origin

For further information on endangered species, please see the following links:
http://www.cites.org/eng/disc/how.php

1.5 PUMA Policy on Uzbekistan and Turkmenistan’s cotton

In recognition of PUMA’s Human Rights Policy, PUMA bans Uzbek cotton completely and officially extends this ban to Turkmenistan. All PUMA suppliers are expected to avoid cotton sourcing from those countries and comply strictly with this cotton origin policy for any PUMA product.

1.6 PUMA Policy on the Use of Nanotechnology

Following PUMA’s commitment to phase out all hazardous substances until 2020 and use the precautionary principle, PUMA will not use any nanotechnology applications unless such applications are analyzed and proved to have no potential negative impact on human health and the environment.

1.7 Environmental Data Collection and Reporting

In cooperation with our majority shareholder, Kering, PUMA uses the environmental software tool Enablon for regular collection of environmental performance data from both our own entities as well as main PUMA suppliers

By regularly completing web-based questionnaires on the usage of energy, water and paper as well as the creation of waste, all PUMA offices, stores and warehouses worldwide are held accountable for their environmental performance.

This data collection also forms the basis for PUMA’s internal management system as well as the data presented in the Annual Report.

Acknowledging the fact that the majority of the environmental impacts of PUMA’s overall environmental footprint are created in the supply chain, PUMA includes all major Tier 1 and exemplary material suppliers into the regular data collection process.

The collected data is then related to the production volume to build relative KPIs, for example of CO2 emissions, energy and consumption as well as waste creation per piece or pair produced.

For more information on the data collection procedure, please contact the PUMA Sustainability Team (Appendix A)
SECTION TWO
Sustainability Targets

2.1 PUMA 10FOR20 Sustainability Targets

PUMA targets to reduce our environmental impact and become more sustainable are encompassed in the PUMA 10FOR20 Sustainability Targets which are inspired by the United Nations Sustainable Development Goals and alimented with PUMA’s majority shareholder, Kering (See Figure 2). With the 10FOR20 targets we will create positive sustainability impact within 10 focus areas.

Following a lifecycle approach starting from product design, we are setting a strong focus on sourcing significant volumes of more sustainable raw materials. PUMA also encourage its supplier chain to adopt Industry Good Practice in manufacturing processes and eventually Zero Discharge of Hazardous Chemical by 2020. Leading by example, PUMAs owned and operated entities are obliged to meet equally ambitious reduction targets as those set for established for suppliers.

In addition, corporate environmental accounting is used to quantify the external damage and benefits caused by PUMA’s business activities. The PUMA Environmental Profit & Loss Account not only puts a price tag on nature’s services, but also provides a useful tool to identify where the largest environmental impacts lie and consequently how those can be optimized.

Acknowledging that we have mainly focused on environmental targets within our own sphere of influence for the period from 2010 to 2015, we have now balanced this with adding health and safety, human rights and governance targets for 2020 as well as shifting our focus deeper into the supply chain.
2.2 Sustainable Consumption of Natural Resources

PUMA encourages own employees and suppliers to efficiently use natural resources, like energy, water and materials. Therefore, PUMA realizes projects such as CONSERV (2011-2013) and SAVE (2013-2015) to enhance its supply chain capacity through trainings, onsite assessment, and consultancy. These projects involve different high impact supply chain operations from Tier 1 suppliers to key fabric mills, leather tanneries. PUMA supports its suppliers in this effort through capacity building projects which include the optimization of production operations and cleaner production technologies.

To download training manuals, e-toolkits and sustainability guidelines on energy, water, waste and management system, please visit: http://PUMA-save.org/

2.3 Reduction and Offsetting of Carbon Emission

PUMA also commits to contribute its fair share to a global warming that is limited to two degrees Celsius. While energy consumption is directly linked to emission of carbon, PUMA encourages suppliers to tap renewal energy sources to curb down carbon footprints. PUMA is an active participant with the Carbon Disclosure Project, uses significant quantities of renewable electricity and has been offsetting the carbon footprint (Scope 1 and 2 according to Greenhouse Gas protocol) for its owned and operated entities since 2010.

2.4 Global Reporting Initiative Sustainability Reporting

PUMA has been publicly reporting its sustainability performance in accordance with the Guidelines of the Global Reporting Initiative since 2004. Starting from 2010 onwards, PUMA’s Sustainability and Financial Reporting have been merged into one central Annual Report. Expanding transparent sustainability reporting into the supply chain, PUMA continues to encourage its key suppliers to publish sustainability reports following the guidelines of the Global Reporting Initiative (GRI).

Selected strategic PUMA suppliers throughout all major PUMA sourcing regions successfully completed a GRI Certified training course, received further support from expert consultants and published their own GRI Sustainability Reports. This helped to further integrate the concept of sustainability into the supply chain, acts as a measurement tool for the overall supplier’s performance and also provides a communication platform to demonstrate supplier initiatives and challenges in the field of sustainability.

For supply chain report, please visit: http://about.puma.com/en/sustainability/reports/supplier-sustainability-reports
For the PUMA Annual Report, please visit: http://about.puma.com/en/sustainability/reports/puma-s-sustainability-reports
SECTION THREE

Environment Management Systems (EMS)

Environmental Management Systems (EMS) are an important vehicle for improving environmental performance by providing various types of organizations with the necessary tools to successfully manage their environmental activities and initiatives.

3.1 Legal Compliance

Full legal compliance forms the basis of every EMS. In most countries, official permits are necessary as proof of compliance with legal requirements. For different production processes, different permits may be required, for example a discharge permit for dye houses or an air emission permit for factories which operate a large scale boiler or electric power generator. Thus it depends on the type and size of production which requirements must be complied with. Typically, permits cover air emissions, effluents and legal waste disposal, which apply for both normal and hazardous waste. The following permitting documents must be secured by PUMA entities and supplier factories where applicable and as required by local laws:

- Environmental Impact Assessment (EIA)
- Environment compliance certificate (or its exemption) as justified by the EIA
- Related permit to operate a business following clearance of complying with relevant environment protection and pollution regulations.
- Environment permit to operate wastewater treatment facilities
- Environment permit to air emission sources (e.g. boilers, power generators, dust collector, onsite incinerator, etc.),
- Environment permit or clearance for transport and disposal of solid waste
- Environment permit for storage, transport and disposal of hazardous waste
- Other environment permit required by national environmental laws

The PUMA Sustainability team expects suppliers to keep up to date with all relevant environmental legislation and act accordingly. To ensure that a factory is in compliance with the local legislation and in accordance with the PUMA Sustainability Standards, an inspection of written environmental permits forms part of the PUMA Sustainability Audit, a precondition for every supplier’s production authorization.

3.2 Plan-Do-Check-Act

Besides PUMA SE’s own operations, all PUMA suppliers shall implement a sound Environmental Management System to ensure legal compliance, effective implementation of an environmental program as well as to achieve continuous improvement. In this regard, PUMA encourages suppliers to secure a certified EMS program like ISO 14001:2015, ISO 50001: 2011 and/or the EU Eco-Management and Audit Scheme EMAS.

For more information on the above certified EMS programs:
- [http://www.iso.org/iso/iso14001](http://www.iso.org/iso/iso14001)
- [http://www.iso.org/iso/iso50001](http://www.iso.org/iso/iso50001)
The implementation of a certified EMS is especially recommended for large suppliers as well as those which are deemed to have substantial environment impact such as factory operations involving wet processes or suppliers employing more than 1,000 employees.

Basically, an EMS implements a system that is geared to achieve continuous improvement following the PDCA concept (See Figure 3 below):

![Figure 3: Plan Do Check Act (Adapted from ISO)](image)

### 3.3 Reporting of Environmental KPIs

In order to measure and monitor progress as well as to properly manage its environment footprint, PUMA established its Environmental Key Performance Indicators (E-KPIs) in terms of energy, water, CO2 and waste per unit of products, square meter of buildings used, financial turnover or per staff full time equivalent (FTE).

To facilitate a regular data collection, from key suppliers worldwide and to enable monitoring, tracking and publishing of the E-KPI performance in the Annual Report, PUMA and PUMA suppliers use the online platform Enablon for regular data collection.

For results of the PUMA E-KPI data collection, please refer to the PUMA Annual Financial and Sustainability Report:

### 3.4 Sustainability Charter for own Entities and Suppliers

In order to give our offices, stores, warehouses and factories a tool to identify easy improvements in the field of environmental protection, the PUMA Sustainability team has developed Sustainability Charters for those sites. The management on site is encouraged to fill in the charter, thereby indicating which actions have already been taken and which are being worked on by displaying a signed charter at the buildings entrance or reception.
3.5 Corporate Environment Profit & Loss Accounting

At PUMA we understand the importance of healthy ecosystems to the future of our business and also recognize that we have to be ethical, accountable, and responsible to our environment. Towards the end of 2009 we embarked on a journey to develop an enterprise and supply chain-wide view of our environmental impacts in monetary terms, so that we could take these impacts into account strategically and embed them in our business decision making processes.

All business operations and supply chains depend on nature for services such as fresh water, clean air, healthy biodiversity and productive land. PUMA’s Environmental Profit and Loss Account (E P&L) is the first attempt to measure the immense value of these services to a business, and the true costs of a business’s impacts on nature. The E P&L measures and values both reductions in ecosystem services and increases in environmental impacts which occur as a result of PUMA’s operational and supply chain activities. For the results of PUMA’s 2015 E P&L results see Figure 6.

**Definition:** An Environmental Profit & Loss Account is a means of placing monetary value on the environmental impacts along the entire supply chain of a given business.

**Profit:** Activities that benefit the environment.

**Loss:** Activities that adversely have an impact on the environment.

**Environmental Impact:** A change in the make-up, functioning, or appearance of the environment. For example, greenhouse gases (GHGs) contribute to climate change which is associated with a range of environmental impacts such as reduced crop yields, changes in water availability and increases in extreme weather. Waste disposal results in GHG emissions as well as environmental impacts from leachate which can affect water courses and local disamenity impacts caused by dust, noise and odor.

By reporting the results of the E P&L we are transparent about the extent of our environmental impacts. We believe this will provide a basis for more meaningful, evidence-based engagement with our stakeholders and enable us to demonstrate clearly the impact of our activities to reduce our impacts. Ultimately, the E P&L will enable us to make better, more informed business decisions that take account of environmental impacts as well as more traditional financial and operational considerations.
Through placing a monetary value on our environmental impacts we sought answers to several important questions:

- How can we help our employees, shareholders and our suppliers understand the magnitude and importance of our impacts on the environment?
- How can everyone in the business grasp the significance of the amount of CO₂ released, the impacts of land conversion required to provide raw materials, or the volume of water consumed and factor this into day to day decision making?
- Relative to one another, which are our most significant environmental impacts?
- Where in our supply chain should we focus our resources to reduce our environmental impacts?
- How can we help others understand the challenge of reducing our environmental impacts, and the work we are doing to manage them?

We recognize that we must account for the cost of nature in our day to day business decisions. Most people in the business and among our suppliers are not familiar with the language of sustainability and often struggle to put figures such as tons of GHG emissions and cubic meters of water into context. We chose to convert our environmental impacts into monetary terms to make them digestible and meaningful to a much wider audience. In doing so we believe we have shed light on the true scale of our impacts, and enabled simpler communication of their implications. The results of our E P&L clearly show that the vast majority of environmental impacts are originating in the supply chain, and here particularly the raw material stage (see Figure 6).

While PUMA has also published an E P&L for selected products and aims to release a corporate level E P&L regularly going forward, the first results clearly reinforce the need to focus on the both processing (tier 3) and raw material (tier 4) stage of the supply chain. As indicated in Figure 6, Tier 3 and 4 represent 36% and 32.7% respectively of all calculated costs to the environment, while PUMA SEs own operations (including transport of products from country of manufacture to selling markets) add up to only 5% which is reduced compared to last report.

As of 2013, Kering, PUMAs majority shareholder, has required their entire brand portfolio (luxury, sport & lifestyle divisions) to implement the E P&L to foster most effective and standardized adoption. Implementation and adoption of the E P&L is required for each and every Kering brand by 2015.

For the full EP&L report by Kering please visit:
For the full report on the PUMA E P&L, please visit:
Figure 5: PUMA Supply Chain taken into account for the E P&L

Figure 6: Results of the PUMA E P&L covering the year 2015
SECTION FOUR
Environmental Key Performance Indicators

PUMA’s targets are in place to reduce our environmental impact and become more sustainable. This section reviews the environmental key performance indicators: CO$_2$ emission, Water, Chemicals and Materials.

4.1 CO2 Emissions

4.1.1 Legal Compliance

All energy related machinery must be in compliance with local legislation. This applies to both a health & safety aspects (please refer to the PUMA Sustainability Health & Safety Handbook for further details) and environmental aspects. It is important to note that large boiler operations, coal burners, etc. must be registered with the local environmental authorities. In addition, local environmental standards on air emissions, safe storage of fuels, etc. must be followed.

4.1.2 Targets

As part of the Commit to Action Campaign on the Road to Paris, PUMA formally committed to developing a science-based target for climate change within the next two years. We also publicly committed to continue reporting on our carbon footprint and climate change program as part of mainstream financial reporting and to a responsible corporate engagement in climate policy.

In line with this joint effort to limit global warming below 2 degrees by end of 2020, PUMA has set the target of CO$_2$ emitted per pair of shoes and piece of apparel and accessories as 3% reduction per annum compared to 2015 baseline (table 1).

<table>
<thead>
<tr>
<th>Division</th>
<th>E-KPI</th>
<th>Unit</th>
<th>Baseline 2015</th>
<th>Baseline 2016</th>
<th>Baseline 2017</th>
<th>Baseline 2018</th>
<th>Baseline 2019</th>
<th>Baseline 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessories</td>
<td>CO$_2$/piece (Scope 1, 2 and Biz travel)</td>
<td>Gr</td>
<td>280</td>
<td>271.6</td>
<td>263.5</td>
<td>255.5</td>
<td>247.9</td>
<td>240.4</td>
</tr>
<tr>
<td>Apparel</td>
<td>CO$_2$/piece (Scope 1, 2 and Biz travel)</td>
<td>Gr</td>
<td>270</td>
<td>261.9</td>
<td>254.0</td>
<td>246.4</td>
<td>239.0</td>
<td>231.9</td>
</tr>
<tr>
<td>Footwear</td>
<td>CO$_2$/pair (Scope 1, 2 and Biz travel)</td>
<td>Gr</td>
<td>870</td>
<td>843.9</td>
<td>818.6</td>
<td>794.0</td>
<td>770.2</td>
<td>747.1</td>
</tr>
</tbody>
</table>

Table 1: CO2 emission target 2016-2020
4.1.3 Carbon Footprint and Energy Efficiency

During the last years energy costs have fluctuated dramatically. At the same time there is a political, as well as, a social focus on the impact of CO₂ emissions and climate change. To reduce both energy costs and CO₂ emissions, energy efficiency programs should be run in every factory, as well as, in larger offices, warehouses and stores.

A first step towards increasing energy efficiency is to measure and analyze the energy consumption and to consider in which areas energy saving measures are feasible. Simple measures such as, switching machines off when not in use, using servo motors in sewing machines or changing to energy efficient LED lighting have proven to be highly profitable at relatively low or no investment cost. Another option is to optimize the heating and cooling of buildings. Typically, air conditioners or heating systems can be adjusted in a range to fit the outside temperature (for example adjusting the inside temperature to 23 instead of 20 degrees Celsius while outside temperature is at 30 degrees Celsius) rather than setting the temperature to maximum power. Taking this aspect further, a good insulation of buildings helps to save energy used for heating and cooling. Furthermore, waste heat from the production process may be used for heating purposes of the building as well as natural ventilation or evaporation cooling effects for energy efficient cooling.

For more detailed information, please refer to the SAVE Guideline and Online-Training on Energy Efficiency at this link:
E-toolkit link in English:
E-toolkit link in Chinese:

4.1.4 Good Practice Examples

**PUMA Plaza, Herzogenaurach**

A good practice example is the PUMA Headquarter, PUMA Plaza, in Herzogenaurach, Germany. Concrete core temperature control is used to efficiently heat and cool the buildings. Three photovoltaic power systems generate around 152,000 kWh of electricity per year and thus aids to save 75 tonnes of CO₂ per year while at the same time generating considerable financial income as the generated power is sold into the public grid. Besides this, all electricity purchased from the public grid runs under a renewable energy tariff, making the whole office Carbon Neutral in terms of electricity consumption. In addition, censors within the building turn off lights automatically if employees are not at their desks or in stairways, thus saving electricity. Heating required during the winter season is generated with using combined heat and power plants from the local energy service provider, and party using landfill gas as fuel.
Such good practices are, however, are not limited to PUMA Headquarter. Our leading suppliers have started to implement similar actions.

**Photovoltaic Power Generation System at Key (Fujian) Microfiber Hua Chang**

With an investment of more than 10,000,000 RMB, the factory has installed rooftop photovoltaic power systems to generate 1,250,000 kWh from renewable source. This results in a reduction of 1,713.8 Ton CO$_2$ emission per year and payback time in 6.5 years (table 2). Since China is on its inevitable trend to move toward the renewables as a source of energy security, Key (Fujian) Microfiber Hua Chang aims to expand its current Photovoltaic Power Generation System before reaching 6.5 year payback period.

**Table 2: Photovoltaic Power Generation System Investment and its Savings.**

<table>
<thead>
<tr>
<th>INVESTMENT</th>
<th>ENVIRONMENTAL BENEFITS (ANNUAL)</th>
<th>ECONOMIC BENEFITS (ANNUAL)</th>
<th>PAYBACK TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Install Photovoltaic Power Generation System</td>
<td>1,540,180 USD</td>
<td>- 1,250,000 kWh&lt;br&gt;- 1,713.8 Ton CO$_2$ emission</td>
<td>236,803 USD</td>
</tr>
</tbody>
</table>
**Replace the firewood to rice husk boiler at Shenzhou Cambodia**

Wood is still an energy source for Garment industries in Cambodia recent days. However the country has seen increasing pressure on forest resources due to rising demand coupled with unregulated harvesting of wood for fuel. By end of 2014, Shenzhen Cambodia were the first factory in its garment industry to replace its firewood to 2 TPH rice husk based boiler with expected life span of 8 years. Signing 5 year contract to purchase the steam at 30 USD/ton, the boiler cost was born by service provider. However the factory still have to invest 100,000USD into the boiler building construction. 766 tons of CO$_2$ emission was mitigated when changing to this green technology. Besides it is estimated that 31,000USD was saved and productivity was increased by additional 31,000 pieces ironed every year.

Table 3: Rice Husk Boiler investment and its savings

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<thead>
<tr>
<th>INVESTMENT</th>
<th>ENVIRONMENTAL BENEFITS (ANNUAL)</th>
<th>ECONOMIC BENEFITS (ANNUAL)</th>
<th>PAYBACK TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change firewood to rice husk boiler</td>
<td>260,000 USD (Building construction 100,000 USD Boiler cost born by supplier 160,000 USD)</td>
<td>• 766 Ton CO$_2$ emission</td>
<td>• 31,000 USD Additional 310,000 pieces ironed</td>
</tr>
</tbody>
</table>

*Figure 9: Changing boiler from firewood to rice husk*

---

1 According to IFC, CO2 emission in Cambodia is as of 112 kg/m$^3$. 
4.2 Water Quality

4.2.1 Legal Compliance

All suppliers should have the necessary permits and licenses from their local authorities to extract and discharge water, may it be from underground sources, surface water or public supply. Moreover, waste water discharge must meet national regulatory compliance standards. For more information on waste water discharge standards, please consult the Handbook of Environmental Standards Volume 2 - Chemical Management as well as the Waste Water Guidance Document of the ZDHC. Under no circumstances should waste water from PUMA suppliers or PUMA entities be illegally discharged to the environment and surrounding communities without an approved treatment process by local authorities.

On the other hand, water efficiency plays critical role in a sustainable manufacturing. Despite the fact that 3% of the earth’s volume of fresh water supply is a renewable resource, the supply of clean and fresh water is steadily decreasing as the world’s population continues to rise. Applying Industry Good Practices will reduce the need for costly investments in water treatment and delivery systems. Industry Good Practices including appropriate monitoring management, efficiency improvements, accurate measurements and constant savings should be implemented at all levels of the supply chain.

For more detailed information, please refer to the SAVE Guideline and Online-Training on Water management at this link:
E-toolkit link in English:
E-toolkit link in Chinese:
Industry Good Practice for consumption and effluent treatment is met by 90% of PUMA key suppliers with wet processing facilities.

### 4.2.3 Waste Water

**Wastewater Effluent Standards**

![Figure 12: Wastewater discharged directly into natural body of water (left) vs. Wastewater properly treated before discharge (right)](image)

Before the final discharge of wastewater into the public sewer system the water must be controlled according to the national laws set forth by the corresponding governments. Under no circumstances should wastewater be directly discharged into natural water bodies (including ground water) without proper pre-treatment.

In case of an onsite wastewater treatment plant, the discharge of the treated water must be controlled according to the parameters mentioned below and according to local environmental regulations. By end of 2016, Zero Discharge Hazardous Chemicals Initiative (ZDHC) will be releasing a Wastewater Discharge Quality Guideline which serves as a unified discharge standard.
for footwear and textile industry. The following recommendations for the minimum parameter controlled by the factories shall be valid until the ZDHC Guideline becomes available.

**Figure 13: Textile Production Benchmark from “Environmental Standards in the Textile and Shoe Sector” published by the German Federal Environment Agency**
### Benchmarks in leather production

#### CONSUMPTION OF RESOURCES AND ENERGY

<table>
<thead>
<tr>
<th>CONSUMPTION PER UNIT PRODUCED</th>
<th>BENCHMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy/fuel</td>
<td>9.3–42 GJ/t raw hide</td>
</tr>
<tr>
<td>Chemicals</td>
<td>~500 kg/t raw hide</td>
</tr>
<tr>
<td>Water consumption</td>
<td>12–30 m³/t raw hide (salted bovine hide)</td>
</tr>
<tr>
<td></td>
<td>32–59 m³/t raw hide (pig skin)</td>
</tr>
<tr>
<td></td>
<td>110–265 l/d (salted sheepskin)</td>
</tr>
<tr>
<td></td>
<td>560 l/d (wool on sheepskin)</td>
</tr>
</tbody>
</table>

Source: IFC-EHS Guidelines „Tanning and Leather Finishing”, adapted by the Umweltbundesamt

#### WASTE WATER EMISSIONS AT THE POINT OF DISCHARGE

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>EMISSIONS VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH value</td>
<td>6–9</td>
</tr>
<tr>
<td>BOD₅</td>
<td>50 mg/l</td>
</tr>
<tr>
<td>COD</td>
<td>250 mg/l</td>
</tr>
<tr>
<td>Suspended solids</td>
<td>50 mg/l</td>
</tr>
<tr>
<td>Sulphide in partial flow containing sulphides</td>
<td></td>
</tr>
<tr>
<td>Chromium VI</td>
<td>0.1 mg/l</td>
</tr>
<tr>
<td>Chromium, total in partial flow containing chromium</td>
<td></td>
</tr>
<tr>
<td>Sulphate a</td>
<td>300 mg/l</td>
</tr>
<tr>
<td>Ammonium-nitrogen b</td>
<td>10 mg/l</td>
</tr>
<tr>
<td>Total Kjeldahl Nitrogen c</td>
<td>10 mg/l</td>
</tr>
<tr>
<td>Phosphorous, total</td>
<td>2.0 mg/l</td>
</tr>
<tr>
<td>Phenol</td>
<td>0.5 mg/l</td>
</tr>
</tbody>
</table>

Source: IFC-EHS Guidelines „Tanning and Leather Finishing”, adapted by the Federal Environment Agency

#### VOC EMISSIONS FROM LEATHER COATING

<table>
<thead>
<tr>
<th>THRESHOLD VALUE FOR SOLENT CONSUMPTION</th>
<th>EMISSIONS VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤25 l/a</td>
<td>85 g VOC/m²</td>
</tr>
<tr>
<td>&gt;25 l/a</td>
<td>75 g VOC/m²</td>
</tr>
<tr>
<td>&gt;100 l/a</td>
<td>150 g VOC/m²</td>
</tr>
</tbody>
</table>

Source: Directive 2016/85/UE

#### VOC EMISSIONS FROM SHOE PRODUCTION

<table>
<thead>
<tr>
<th>THRESHOLD VALUE FOR SOLVENT CONSUMPTION</th>
<th>EMISSION VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤5 l/a</td>
<td>25 g VOC per pair</td>
</tr>
</tbody>
</table>

Source: Directive 2016/85/UE

---

**Figure 14:** Leather Production Benchmark from “Environmental Standards in the Textile and Shoe Sector” published by the German Federal Environment Agency

---

The above values are to be seen as recommendations only. All factories should follow the national environmental regulations for the discharge of wastewater into the public sewer systems.
**Wastewater testing and disclosure**

The purpose of waste water testing is twofold:

A, to ensure our vendors and material suppliers apply adequate waste water treatment methods and technology to avoid any negative environmental impact on the receiving water body;

B, to ensure industry specific priority hazardous chemicals (as defined in the Manufacturing Restricted Substances List of the ZDHC) have been eliminated from Puma’s supply chain.

PUMA started to ask its wet processing suppliers to conduct specific waste water tests from 2014 onwards, with the aim to cover 80% of the material sourcing volume. In 2014, the required testing parameters focused on 11 priority chemicals including Phthalates, Flame retardants, and Azo dyes, Organotin compounds, Chloro-Benzenes, Chlorinated solvents, Chloro- Phenols, APEO, PFCs and Heavy metals. In 2015 we added another 10 general waste water parameters including BOD, COD, TSS, TDS, phosphorus, Sulfide, pH, color, phenolic, calcium and magnesium hardness. From 2017, Puma will be aligning the waste water testing strategy with ZDHC’s waste water quality guideline. This means all Puma’s core factories with wet processing should perform waste water testing according to ZDHC Waste Water Guideline on annual basis. The ZDHC Waste Water Guideline will be published in September 2016.

For more information please visit: [http://www.roadmaptozero.com/](http://www.roadmaptozero.com/)

PUMA believes in transparency and the right to know for local stakeholders on what is being discharged into local water bodies. Therefore, we have asked our largest suppliers with wet processing facilities to publish their test reports at an online platform run by the Chinese NGO Institute of Public and Environmental Affairs (IPE).

For more information on IPE and to upload or access the published test reports please visit: [http://www.ipe.org.cn/En/pollution/discharge_detox.aspx](http://www.ipe.org.cn/En/pollution/discharge_detox.aspx)

**Waste Water Treatment and Water Efficiency of Dyeing Mills**

The largest waste stream from most textile mills involved in their washing, bleaching, and dyeing operations is wastewater. Textile mill wastewater is often contaminated with process chemicals (dye, salt, bleach, detergent, etc.), oil and energy from hot water discharges (see the PUMA Sustainability Handbook - Chemical Management for more details). As a result, wastewater discharge permit limits, such as BOD (biological oxygen demand), COD (chemical oxygen demand), aquatic toxicity, and metals content, are often difficult to meet. Water usage in a typical mill can easily top 1.5 Million m³ per day costing more than US$30,000 annually in water and sewer fees. Only 3% of the available water of the world is drinkable water, which has to be protected wherever possible.

Spills and clean-ups can be a major source of water pollution. Process chemicals are stored, mixed, transported and spilled unfortunately in most mills. Seemingly minor spills can have major impacts on wastewater. A spill of 5 pounds of salt will contaminate 10,200 m³ of water. In addition, if a 50-pound bag of salt bursts during handling, 1.2 Million m³ of water could be contaminated. If a liquid product is spilled, dry clean-up, using absorbent clay and sweeping, is a much better and safer solution than washing it down the floor drain.

Water usage can be reduced in mills by making simple housekeeping changes in addition to process modifications. A single hose left running will waste 27.2 m³ of water daily and cost more than
US$5,000 annually in increased water usage. A very simple solution for example is to attach a spring loaded nozzle, costing less than US$5, to the hose. Leaks may also cause water inefficiencies in mills. Heavy use of salt, acid, and caustic often results in valve and piping failure. Replacing steel valves and piping with plastic is a low-cost way to reduce leaks.

Process changes can make substantial reductions in water and energy use. Water flow through a rinsing process can be reduced by 50% if counter current or two-stage rinsing is used.

**Counter Current Rinsing**

Counter current rinsing is a process where the "dirtiest" fabric contacts the "dirtiest" water first; clean water rinses the fabric as it leaves the process. Continuous rinsing processes are usually designed with counter current rinsing. Batch processes can be modified to use two-stage or multi-stage rinsing, where water used for rinsing the previous bath is used to provide initial rinsing of the next batch. This water is then discharged and clean water is used to provide final rinsing. A two-stage process like this one may replace three separate rinsing cycles using clean water to achieve the same level of cleanliness.

There are many opportunities to reuse wastewater in a textile mill. Some mills have reduced operating costs substantially by installing water reuse systems. Some dye-houses have successfully implemented heat exchangers in their wastewater stream and others realized a closed water cycle by filtering and re-using their process water. For example, final rinse water from dyeing can be used as make-up water for the dye bath. Final rinses from scouring and bleaching may be used for makeup water in de-sizing. In addition, wastewater from many sources may be suitable for the washing process equipment and floors (after sweeping or other dry clean-up).

Suggestion for Pollution Prevention for Textile Mills:

- Store dry materials, such as bags of salt or dye drums, off the floor and away from liquids by placing catch pans beneath the material
- Plug floor drains in material storage areas
- Build curbs around storage areas to keep spills in and water out
- Remove water supplies from storage areas
- Use dry clean-up methods; provide brooms, vacuums, and absorbents
- Provide suitable work areas handling tools, and training to operators so they can avoid creating spills
- Provide recipes for each mixture to operators
- Provide measuring equipment to operators
- Optimize chemistry; correct temperature can reduce the use of salt and dye
- One size does not fit all; use small volume equipment for small production runs
- Place spring-loaded nozzles or timers on all water supplies to turn off when not used
- Select valve and piping material to minimize corrosion and leaks
- Avoid filling process equipment with water from unmetered hoses; place meters on water supplies feeding process equipment
- Use counter current or multi-stage rinsing to reduce water use
- Reuse wastewater from other processes that do not require high quality water
- Test incoming water supply for minerals or chemicals that negatively affect the process
4.2.4 Good Practice Examples

Water Recycling, Ningbo Shenzhou, China

Ningbo Shenzhou is one of PUMA SEs key vertically organized apparel partners in China with a total capacity of 13 million pieces per month. As water is one of the limited resources in China, Shenzhou Ningbo has continuously been investing into water recycling since 2005. Since 2011, the capacity increased up to 15,000 tons of recycled water every day. The recycled water originates from the fabric washing process and is treated in the recycling plant. The recycled water is then placed back into the process to provide 25-30% of water consumption in the fabric washing (figure 14).

Water Recycling, Dongguan TaiHing Zipper, China

In 2014, average monthly water consumption at Taihing was 3,324.75 m$^3$. It’s advised the factory’s dyeing water recycling system was not well maintained over the years therefore the amount of qualified recycling water was much less than expected. The factory had changed new suction pump and rearranged its pipeline system. PE pipes were replaced PVC ones which are less durable. The reconstruction of water recycling system along with other implementation of water use methods has

Figure 15: Example of counter current rinsing in fabric dying process

Figure 16: Water recycling in Shenzhou Ningbo
led to a monthly average use of 2,583.33 m³. This results in a reduction in water use of 22.3% in comparison with the same period of last year.

Rainwater Harvesting in Square Fashion

Our key partner in Bangladesh set up a rain water collection system with 2 ponds and the total capacity of 8,389 m³ of water. The total area contains 100,000 square feet on-site of the factory complex. Since 2014, the rainwater harvesting pond is under renovation to increase the capacity to 20,922 m³.

The amount of rain water usage is constantly increased since 2012 as following table:

Table 4: Water consumption from water harvesting

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8,544 m³ (30% of boiler water consumption)</td>
<td>11,446 m³ (41% of boiler water consumption)</td>
<td>Approx. 3,500 m³ (12 % of boiler water consumption)</td>
</tr>
</tbody>
</table>

4.3 Waste

4.3.1 Legal Compliance

All waste disposal or recycling efforts must meet legal requirements. This includes the usage of officially authorized waste and recycling contractors. Specific standards apply for wastes classified as hazardous waste. Please refer to the section on hazardous waste below. Under no circumstances should waste from PUMA suppliers or PUMA entities end up in illegal landfills, dumped into rivers or burned illegally on factory premises or elsewhere.
4.3.2 Hazardous Waste

Hazardous waste is a special type of waste that cannot be disposed of by common means as it can or could pose substantial or potential threats to public health and/or the environment. Hazardous waste can be in the form of gas, liquid or solid. The US Environmental Protection Agency (EPA) defines hazardous wastes as materials that are known or tested to exhibit hazardous characteristics such as:

- **Toxic** - Waste that are containing concentration of certain substances that exceeds regulatory threshold which are expected to cause injury or illness to human health or harm to the environment.
- **Corrosive** - Acid waste with pH less than or equal to 2 and bases with pH greater than or equal to 12.5 that are capable of corroding metal containers such as storage tanks, drums and barrels. An example is battery acid.
- **Flammable** - Flammable or ignitable waste can cause fire under certain conditions and spontaneously combust or have a flash point less than 60°C. Examples are waste oil and used solvents.
- **Reactive** - Waste that are unstable under normal conditions and can cause explosions, toxic fumes, gases or vapour when heated, compressed or mixed with water. Examples are lithium-sulphur batteries and explosives.

Factories must comply with all international and national laws related to storage, handling, transport and final disposal of hazardous waste. In many countries, companies are required to register the type and quantity of hazardous waste that are being generated from their operations. Every factory is also required to have trained personnel on staff to handle hazardous waste. National environmental authorities also require a legitimate and duly authorized hazardous waste transporter as well as a legally authorized hazardous waste disposal and treatment facility. PUMA strictly requires all suppliers to comply with these relevant hazardous waste regulations.

4.3.3 Solid (Non-Hazardous) Waste

The increasing volume of waste during manufacturing processes and the lack of regulations for the treatment and/or disposal of the waste in developing countries are seen as a significant risk for the future. The occurrence of waste cannot be avoided in most of the production phases but the reduction of waste should be considered for all manufacturing steps. All parties involved in the production of PUMA products should take measures to encourage the options that deliver the best overall environmental outcome.
**Prevention** is closely linked with improving manufacturing methods and influencing consumers to demand greener products and less packaging.

**Reuse** is any operation by which products or components are not wasted and used again for the same purpose for which they were conceived.

**Recycling** is any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

**Energy Recovery** from waste is conversion of non-recyclable or reusable waste materials into useable heat, electricity, or fuel through a variety of processes, including combustion, gasification, pyrolysis, anaerobic digestion, and landfill gas (LFG) recovery.

**Land Fill or Incineration without Energy Recovery** is the only final way for waste treatment will be the disposal or the incineration of the waste if none of the above possibilities are feasible. In any case, all relevant laws and regulations of applicable countries must be followed. The disposal route of waste must be entirely documented by official waste contracts or invoices.

### 4.3.4 Good Practice Example

**Replacing polybags with reused fabric bags in Shenzhou Cambodia**

Reusable fabric bags are a necessary alternative to plastic ones which have become a significant environmental problem. Shenzhou Cambodia has been applying successfully this idea in different processes such as Cutting, Sewing and Printing for multi-purpose storage. The factory avoids 1.2 ton of plastic waste generation every year with 10 month payback time.

<table>
<thead>
<tr>
<th>INVESTMENT</th>
<th>ENVIRONMENTAL BENEFITS (ANNUAL)</th>
<th>ECONOMIC BENEFITS (ANNUAL)</th>
<th>PAYBACK TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace polybags with reused fabric bags</td>
<td>2,400 USD</td>
<td>1,200 kg plastic waste</td>
<td>3,000 USD</td>
</tr>
</tbody>
</table>
Take back policy and downsacle recycling in Beautiful Spring, Takeo, Cambodia

In the past, many empty drums in different sizes were disposed as hazardous waste which was costly. A new take back policy has become the primary motivation for the factory management to work with local suppliers on take back and recycling options. For example, Beautiful Spring turned non-hazardous drums which into useful waste collection bins or other tools.

The take back policy, down scale recycling, reused paper and reward program have been successful so far and resulted in savings for the factory as shown in table 5:

Table 5: Waste mitigation and its savings

<table>
<thead>
<tr>
<th>INVESTMENT</th>
<th>ENVIRONMENTAL BENEFITS (ANNUAL)</th>
<th>ECONOMIC BENEFITS (ANNUAL)</th>
<th>PAYBACK TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take back policy, downsacle recycling, reused paper and reward program</td>
<td>No significant investment</td>
<td>55 tonnes in waste disposal</td>
<td>3,902 USD</td>
</tr>
</tbody>
</table>

Figure 21: Reused fabric bags in Cutting, Sewing and Printing

Figure 22: Paper reused

Figure 23: Downsacle recycling
4.4 Production Related Environmental Standards/ Manufacturing RSL (MRSL)

In line with PUMA SEs environmental policy, PUMA's Manufacturing Restricted Substances List (MRSL) supplement our product Restricted Substances List (RSL) policy and PUMA SEs own environmental efforts.

For the purpose of uniform application throughout its global supply chain, the PUMA RSL and MRSL are derived from the RSL of the AFIRM Group and the MRSL of the ZDHC initiative. Both apply the high standards while taking into considerations all existing legal requirements for consumer safety and the protection of the environment.

4.4.1 Soil and Ground Water Protection

Wastewater, chemicals, oils or other toxic liquid substances represent a risk of contaminating the soil and ground water. It is important to avoid migration of any of these liquids into the ground (see Figure 20) or the aquatic environment. Those hazardous and toxic substances must be stored in a secondary containment. Factories must ensure that storage areas and containers are designed and operated to minimize the risk of any releases. To achieve this safeguard, storage areas should be located away from watercourses and sensitive boundaries. In addition, storage areas should avoid being adjacent to areas of public use and should be protected against vandalism. These storage areas should be clearly marked and containers should be clearly labelled. All factories are urged to not exceed the maximum storage capacity of their storage areas. It is important that containers are regularly inspected. The entire storage area should be built as a secondary containment, for example, by using special paint to make the floor impermeable and building surrounding bund walls. Alternatively, when secondary containment installations are not possible, protection trays may be used for all containers. It is the producer’s obligation to have emergency plans ready in the event of accidents or cases of damaged or leaking containers.

The storage of open containers, even if empty, in an outside area should be avoided. Otherwise rainwater might mix with the rest of the chemicals and contaminate the soil, ground water or adjacent water-bodies. Any storage must be bounded and sealed, as explained above.

4.4.2 Oil Contamination

Minor oil spill and leakage are often the most unnoticed if not ignored in many factories or plants. This usually comes from lubricants, fuel oil, etc. Oil contains hazardous and toxic chemicals such as heavy metal leads that can contaminate the soil and ground water where drinking water might be extracted, posing a direct risk to human health. In run-off, like in case of rain, the spilled oil will be...
carried into the public drainage system and will end up in the rivers, seas or other surface water systems. Oil does not dissolve in water and it can form a very thin film on the water surface. Therefore, a small amount of oil can pollute a vast area of surface water. Apart from the toxic effect to aquatic organisms, the oil film covering the surface of the water prevents natural biochemical processes, like photosynthesis, from happening and therefore endangers the aquatic ecosystem.

All factories should make all employees aware of the risks of improper handling of oil, oil spills and leakages. All oil containers, large or small, should always be provided with secondary containment to prevent oil spill or leakage to the ground or drainage at all times. It is not advisable to allow oil to contaminate the wastewater stream, even though it will go to wastewater treatment facility, because oil is not only difficult to remove from the water but also affects the physical-chemical process of wastewater treatment. It is always advisable to contain all oil spills and leakage because even if oil is dirty, there are many technologies available to reprocess the oil and reuse it either as low grade lubricant or fuel.

4.4.3 Air Pollution Control

All suppliers must be aware of and strictly follow the local regulations pertaining to air pollution. Depending on the type and size of operations, devices for the prevention of air pollution might be necessary.

Typical examples would be:

- Filters for exhaust systems carrying volatile organic compounds (solvents)
- Dust filters for exhaust systems from dusty areas, e.g. knitting departments; outsole grinding or buffing in shoe factories
- Filters for larger burners, i.e. for steam generators or heating systems

Regular checks on the quality of discharged air must be performed to ensure that all equipment is working properly. The records for these checks should be kept for a minimum of two years.
SECTION FIVE
More sustainable raw materials

5.1 BCI

The Better Cotton Initiative (BCI) is a not-for-profit organization stewarding the global standards for Better Cotton, and bringing together cotton’s complex supply chain, from the farmers to the retailers. BCI exists to make global cotton production better for the people who produce it, better for the environment it grows in and better for the sector’s future, by developing Better Cotton as a sustainable mainstream commodity.

PUMA is a member of the BCI since January 2016 and in line with PUMA sustainability targets, aimed to source 50% of its cotton from BCI by 2020. All key fabric suppliers are strongly encouraged to become BCI members. For further information, please follow the following link: http://bettercotton.org/

5.2 Bluesign®

PUMA became a Bluesign® system partner in 2014. The Bluesign® system focus guarantees the application of sustainable ingredients in a clean process at which end stands a safely manufactured product. As a result, the textile industry manages the natural resources soundly and responsibly, reduces water and air emissions, improves its waste water treatment and generally reduces its ecological footprint. With this holistic approach, the Bluesign® system unites all partners of the textile industry in order to realize an environmentally friendly, sustainable textile production worldwide. PUMA believes in the approach of an input-stream management system and highly encourages all suppliers to become Bluesign® system partners. Within our strategy to focus on more sustainable raw materials, we have set the target of increasing the use of Bluesign® approved materials in our product range to 50% until 2020. For further information on the Bluesign® system.

For further information on Bluesign®, please visit the following link http://www.bluesign.com.

5.3 Leather Working Group

The Leather Working Group (LWG) was formed in April 2005 to promote sustainable and appropriate environmental stewardship practices within the leather industry. The LWG created a protocol to accurately assess the compliance and environmental stewardship practices of leather manufacturers. Leather being used for PUMA products is sourced through the Leather Working Group certified tanneries. The objective of the multi-stakeholder initiative is to develop and to maintain a protocol which assesses the environmental compliance and promotes the sustainable environmental business within the tanning industry.

The LWG certifies tanneries with a bronze, silver and gold rating, as well as a classification for leather traceability. PUMA has set a target of 90% leather from certified tanneries, which was already met in 2015. PUMA will continue to source leather almost exclusively from LWG certified tanneries and aims to increase the leather with a traceability grading of A or B over time.
For further information on the LWG, please visit the following link:
http://www.leatherworkinggroup.com

5.4 FSC®

The Forest Stewardship Council (FSC®) sets standards for responsible forest management. A voluntary program, FSC® uses the power of the marketplace to protect forests for future generations. To ensure forests are responsibly managed, FSC® evaluates against 10 principles and 57 criteria. Among other things, they ensure that waterways and wildlife habitat and species are protected, and high conservation value forests that contain biodiversity values and rare or threatened ecosystems are preserved.

To uphold high environmental standards, the PUMA standard shoebox is made from over 95% recycled and fully FSC® certified material. For further information on the FSC®, please see the following link: https://us.fsc.org/en-us

SECTION SIX

Industry Collaboration

6.1 Sustainable Apparel Coalition

The Sustainable Apparel Coalition is an industry-wide group of over 60 leading apparel and footwear brands, retailers, suppliers, nonprofits, and NGOs working to reduce the environmental and social impacts of apparel and footwear products around the world. The Sustainable Apparel Coalition was founded by a group of sustainability leaders from global apparel and footwear companies who recognize that addressing our industry’s current social and environmental challenges are both a business imperative and an opportunity.

Through multi-stakeholder engagement, the Coalition seeks to lead the industry toward a shared vision of sustainability built upon a common approach for measuring and evaluating apparel and footwear product sustainability performance that will spotlight priorities for action and opportunities for technological innovation.

PUMA became an active member of the Sustainable Apparel Coalition in 2011. The aim of the coalition is to work together to reduce the environmental and social impacts of apparel and footwear products around the world. PUMA is actively engaged in several environmental and the social working group within the coalition. Active membership in the SAC gives PUMA and PUMA Suppliers the opportunity to work in collaboration with our industry peers on common goals. These goals are

Figure 27: HIGG Index 2.0 suite of tools
related to environmentally friendly products, production processes and improving working standards within the supply chain.

In 2012 the Sustainable Apparel Coalition launched the HIGG Index. In 2013 the Sustainable Apparel Coalition launched the HIGG Index 2.0. The HIGG Index 2.0 is an indicator based sustainability assessment tool measuring the impact at the Facility, Brand, and Product levels. PUMA recommends core suppliers in all three tiers to complete the Facilities modules for both environmental and social labor performance as preparation for future PUMA product scoring as well as valuable source of information on sustainability trends and best practices.

PUMA collaboration with the Sustainable Apparel Coalition continued in 2015 with the testing, development and launch of HIGG Index 3.0. PUMA has tested the HIGG Index 3.0 for selected apparel and footwear products.

### 6.2 Zero Discharge of Hazardous Chemicals (ZDHC)

According to its approach based on prevention and precautionary principle, PUMA is committed to zero discharge or to eliminate the discharges of all hazardous chemicals\(^2\) from the whole lifecycle and all production procedures that are associated with the making and using of PUMA products by 2020. As such, PUMA recognizes the urgent need of reducing and eliminating industrial releases of all hazardous and harmful chemicals. In 2011, a group of major apparel and footwear brands and retailers made a shared commitment to help lead the industry towards zero discharge of hazardous chemicals by 2020. PUMA and other participants published the release of a joint roadmap towards zero discharge of hazardous chemicals in the supply chain. The roadmap is highly ambitious; it is a plan that sets a new standard of environmental performance for the global apparel and footwear industry. It includes specific commitments and timelines to realize this shared goal.

Within the roadmap, in collaboration with ZDHC member brands, the ZDHC developed a Manufacturing Restricted Substances List (MRSL) for the apparel and footwear industry. It addresses hazardous substances potentially used and discharged into the environment during manufacturing processes, not just those substances that could be present in the finished product. The MRSL assists the industry and their supply chains to adopt a harmonized approach to the control of hazardous substances used to process textile and trim materials in apparel and footwear. PUMA has adopted the ZDHC MRSL and expects all its direct and indirect suppliers to implement a conformance process accordingly.

In addition to the MRSL, the ZDHC has developed a generic environmental audit protocol for suppliers with wet processing facilities or other significant environmental impact. PUMA is using the ZDHC environmental audit protocol since 2014 to audit selected key material suppliers (refer to 6.3). In order to avoid duplication of efforts and audit fatigue, PUMA joined forces with other sporting goods brands and accepts their audit reports as well as shares own audit reports. Besides this cooperation, PUMA also accepts environmental audits by the Leather Working Group and bluesign® Technologies. Suppliers without wet processing will be routinely audited by PUMAs general compliance audit protocol which includes an environmental section besides social as well as health and safety sections.

\(^2\) The hazardous chemicals refer to ZDHC MRSL listed chemicals.
For more information about ZDHC, the Governance Policies and Procedures, and MRSL please refer to PUMA Sustainability Handbook – Chemicals Management and please visit: http://roadmaptozero.com

6.3 Environmental Audits

Our specific environmental audits allow us a chance to closely look at how’s the environmental performance in the factories, and how could brands and supplier work together to improve our supply chain's performance, and finally achieve the zero discharge in 2020.

With the creation of the ZDHC in 2011 and the subsequent formulation of a ZDHC joint environmental audit protocol, PUMA has gone one step further; from 2014, we are going to make sure our core factory including vertically integrated suppliers, as well as material suppliers have undergone at least one detailed environmental audit. To avoid duplication of effort and audit fatigue, PUMA joined forces with other brands in the sporting goods sector, and accepts environmental audits conducted by other ZDHC brands as well as the Leather Working Group (LWG) and bluesign®. With these co-operations in place, Puma has taken the lead and conducted environmental audits for 12 key material suppliers globally in 2015, including 4 factories in China mainland, 3 in Taiwan, 3 in Bangladesh, 1 in Turkey, and 1 in Guatemala. The 12 factories involve different types of factories ranging from knitting mills, dyeing mills, tanneries, synthetic leather producers, to Zipper, golf, and vertical suppliers. These factories were either audited by Puma’s internal auditors or the global audit firm ITS. From the perspective of Puma divisions, there are 5 apparel factories, 3 footwear factories, 3 accessory factories, and 1 Cobra Golf factory covered.

6.4 IPE

The Institute of Public and Environmental Affairs (IPE) is a registered non-profit organization based in Beijing. Since its establishment in May 2006, the IPE has developed a pollution database to monitor corporate environmental performance. IPE’s aim is to expand environmental information disclosure to allow communities to fully understand the hazards and risks in the surrounding environment, thus promoting widespread public participation in environmental governance.

Every year, IPE publishes CITI Index with NRDC to evaluation brand’s environmental performance, records factories’ environmental violation record in China Mainland. Moreover IPE develops the PRTR and Detox data platform to collect factory’s Detox data and other environmental performance data. Therefore PUMA requires its suppliers based in China Mainland to:

- Track their environmental violation record on IPE pollution map database. And, if there is any violation, the factory in question should communicate with IPE and PUMA their following up actions;
- Report their detox information on IPE detox platform based on Puma’s request;
- Report their environment KPI and other relevant data on IPE RPTR platform based on Puma’s request.

For more information about IPE and its CITI index please visit: http://www.ipe.org.cn/en/default.aspx


APPENDIX

A. Contacts

If you have any questions or need additional information, please contact us. You can find the main PUMA contacts for each subject in the following table:

| Waste Water Testing and Guidance, IPE Platform, Environmental Audits | Mr. Ray Niu  
Mr. Stefan Seidel | Ray.Niu@puma.com  
Stefan.Seidel@puma.com |
|---|---|---|
| PUMA RSL Database, Restricted Substances List, AFIRM, RSL Remediation Procedure | Mr. Edelberto Anit  
Ms. Kai-Ingela Gerasch | Edelberto.Anit@puma.com  
Kai-Ingela.Gerasch@puma.com |
| ZDHC, MRSL | Ms. Kai-Ingela Gerasch  
Mr. Stefan Seidel | Kai-Ingela.Gerasch@puma.com  
Stefan.Seidel@puma.com |
| bluesign® System Partnership | Ms. Kai-Ingela Gerasch  
Ms. Janice Ngai | Kai-Ingela.Gerasch@puma.com  
Janice.Ngai@puma.com |
| Better Cotton Initiative | Ms. Joana De Brito | Joana.deBrito@puma.com |
| ENABLON, HIGG Index, sustainability project | Ms. Vy Truong  
Mr. Stefan Seidel | Vy.Truong@puma.com  
Stefan.Seidel@puma.com |

B. UN Global Compact Principles

The Ten Principles

The UN Global Compact’s ten principles in the areas of human rights, labour, the environment and anti-corruption enjoy universal consensus and are derived from:

- The Universal Declaration of Human Rights
- The International Labour Organization's Declaration on Fundamental Principles and Rights at Work
- The Rio Declaration on Environment and Development
- The United Nations Convention Against Corruption

The UN Global Compact asks companies to embrace, support and enact, within their sphere of influence, a set of core values in the areas of human rights, labour standards, the environment and anti-corruption:

**Human Rights**

- Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights; and
- Principle 2: make sure that they are not complicit in human rights abuses.

**Labour**

- Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
- Principle 4: the elimination of all forms of forced and compulsory labour;
- Principle 5: the effective abolition of child labour; and
- Principle 6: the elimination of discrimination in respect of employment and occupation.
Environment

- **Principle 7**: Businesses should support a precautionary approach to environmental challenges;
- **Principle 8**: undertake initiatives to promote greater environmental responsibility; and
- **Principle 9**: encourage the development and diffusion of environmentally friendly technologies.

Anti-Corruption

- **Principle 10**: Businesses should work against corruption in all its forms, including extortion and bribery.
C. Sustainability Charters for Offices, Stores Warehouses

### Sustainability Charter for PUMA Offices

In PUMA, we are committed to reducing our environmental impact and we have clear goals to achieve this. In this office we...

#### CO₂

- ... Promote environmentally friendly means of transportation for employees
- ... Switch to a more environmentally friendly car fleet
- ... Promote local/organic food at the canteen
- ... Support the "Meat Free Monday" Campaign
- ... Promote conference calls or video conferences instead of business trips where feasible

#### Energy

- ... Monitor and analyze consumption quarterly
- ... Use efficient lighting in offices
- ... Install a main switch to turn off all electronic devices
- ... Install motion sensors for lights
- ... Use cooling and heating wisely
- ... Promote use of renewable energies
- ... Install appliances with a good energy rating
- ... Undertake regular maintenance to ensure all devices are working correctly and efficiently
- ... Activate energy-efficient mode in all computers, printers and copiers

#### Water

- ... Monitor and analyze consumption quarterly
- ... Install water saving devices on basin faucets/taps
- ... Install water-efficient toilets
- ... Recover rainwater where feasible
- ... Use environmentally friendly cleaning products
- ... Water green areas wisely

#### Waste

- ... Recycle ink cartridges
- ... Sort and recycle waste wherever possible
- ... Reuse and recycle envelopes and packaging
- ... Safely dispose all fluorescent bulbs/batteries
- ... Remove disposable tableware from the canteen

#### Paper

- ... Promote a paperless office policy
- ... Use recycled paper or paper from certified sources

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Please contact sustain@puma.com if you have any ideas on how to make our offices more sustainable!
D. Useful Links and References

PUMA Sustainability Reports:

Global Reporting Initiative:
https://www.globalreporting.org/

BVT Guidance (German Environmental Agency):
http://www.bvt.umweltbundesamt.de/

Greenpeace Detox (ZDHC):
http://www.greenpeace.org/international/en/campaigns/toxics/water/detox/

UN Global Compact:
http://www.unglobalcompact.org/

UNEP Carbon Neutral Network:
http://www.unep.org/

Sustainable Apparel Coalition:
http://www.apparelcoalition.org/

Bluesign:
http://www.bluesign.com/

Leather Working Group:
http://www.leatherworkinggroup.com/

Textile Exchange:
http://textileexchange.org/

Environmental Protection Encouragement Agency (Cradle to Cradle):
http://epea-hamburg.org/index.php

Global Organic Textile Standard GOTS:
http://www.global-standard.org/

Organic Exchange:
http://www.ecocert.com/en

Recycled Polyester certified by Global Recycle Standard GRS:
http://textileexchange.org/content/global-recycle-standard

Cotton made in Africa:

Blue Sign certificated Fabrics:
http://www.bluesign.com

Leather Working Group certified Leather:
http://www.leatherworkinggroup.com/

FSC Certified Paper and Cardboard:
https://ic.fsc.org/en
All Cradle2Cradle certificated Materials:  
http://www.c2ccertified.org/

Fairtrade certified cotton or Sports balls:  
http://www.fairtrade.net/

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