Economic benefits of standards

Baltika Breweries, Russian Federation

Country: Russian Federation
ISO member body: GOST R
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International Organization for Standardization

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1 Objectives and organization of the pilot project

In 2007, ISO began developing a methodology to assess the benefits of standards for organizations, in particular companies. The methodology applies a microeconomic approach, i.e. it addresses individual organizations of any industry independently of their type and size, but can be extended to the study of industry sectors.

Between 2010 and 2012, the methodology was applied in 21 case studies within 19 different countries and the results were published by ISO in two volumes in 2011 and 2012. No Russian companies were included in these case studies.

However, in May 2013, ISO launched a project in partnership with its member for the Russian Federation, GOST R, and Baltika Breweries to assess the benefits of standards for the latter. The study focused on the benefits reaped within several operations of the company thanks to the use of national, regional, international or other consensus-based standards developed by standards organizations. An ISO project team visited Baltika in St. Petersburg in June 2013 for interviews with staff in key management functions. The project was completed beginning of September 2013.

2 Introduction of the selected company

2.1 Baltika Breweries

Baltika started off as one of the breweries within Lenpivo, the Leningrad Association of the Beer Brewing and Non-alcoholic Beverages Industry. Construction of the brewery began in 1978 and it became the state enterprise Baltika Brewery in 1990. In 1992 the company was privatized and became an Open Joint-Stock Company. Baltika'

ambition has always been to produce the highest quality of European beer, brewed according to traditional technology. The company began its regional expansion in 1997, later changing its name from "Baltika Brewery" to "Baltika Breweries"[1] and in 2006 merged with three other breweries: Vena, Pikra and Yarpivo to become one entity. In 2012, the Carlsberg Group (Denmark) became the sole owner of Baltika Breweries.

Today, Baltika is among the largest, and most dynamic consumer goods companies in the Russian Federation and the Baltika brand is one of the most valuable in the country. Baltika's products are available in 98 % of Russian retail outlets selling beer and the company exports its products to 75 countries around the world including Western Europe, North America, and the Asia-Pacific region.

Baltika is the market leader for beer in the Russian Federation with a market share of 38.2 % in 2012, far ahead of its main competitor that had a market share of 14.7 % in the same year. Its main competitors in the Russian market are AB Inbev, Efes and Heineken. The company operates 10 breweries in different cities of the Russian Federation producing over 30 different brands of beer and 8 non-beer brands.

In 2012, Baltika employed 8'840 people and achieved a revenue of 89 261 000 000 Roubles (around 2.1 billion Euro) and profits of 6 284 000 000 Roubles (around 145 million Euro).

Despite new regulations and restrictions in the Russian Federation, such as increased beer taxes and a ban on alcohol sales at night and at non-stationary points of sale (kiosks and pavilions), Baltika foresees development opportunities in Russia. Owing to its innovative approach to gaining market share and extending sales to foreign countries

1) In this report, Baltika Breweries will be referred to as "Baltika" or "the company".

through consumer research, marketing and brewing technology, the company has remained competitive

While Baltika also produces, and has been successful, in the non-alcoholic and light alcoholic beverages categories (in 2011 non-beer sales grew by 8.2 %), this assessment project focuses on the beer segment, which constitutes the biggest share and is the core business of Baltika.

Item	Description
Company name, location and address	JSC Baltika Breweries 6th Verkhny per., d. 3 194292, St. Petersburg
Website	http://eng.baltika.ru (in English) http://www.baltika.ru (in Russian)
Main product classes	Beer (main product), over 30 different brands, soft drinks, low alcoholic drinks
Annual revenues	89 261 000 000 Roubles (as of 31.12.2012)
Number of staff	8 840 people (as of 31.12.2012)
Number of units and respective locations	10 Breweries in Russia (as of 31.12.2012)
Foreign markets	Export to 75 countries (as of 31.12.2012)

Table 1 – Baltika Breweries key information

2.2 Trends in the beer market

The global and Russian markets for beer have been impacted by the financial crisis of 2008. Consumer income has reduced and, consequently, so has consumption. According to Baltika Breweries, the market fell by 10 % in 2009 as compared to the previous year, by 4 % in 2010 and by a further 3 % in 2011. The market for beer in the Russian Federation in 2011, as estimated by Baltika Breweries, was 90.8 million hectolitres, and in 2012 it was estimated to be 90.4 million hectolitres.

The market for grains, barley and malt, the main inputs for beer, is quite volatile as it strongly relies on weather conditions. Cooler summers have affected the grain market, raising the price of these raw materials, and, consequently, beer prices and sales.

UK-based SAB Miller has made a strategic alliance with Anadolu Efes, by transferring its Russian and Ukrainian units in exchange for a 24 % holding of Istanbul-based Anadolu Efes. SAB Miller's assets and brands will be transferred to Anadolu Efes, making Efes the second largest market player for beer in the Russian Federation.

Increased prices for beer (due to new regulations and reasons mentioned above) and raw materials have affected the industry's growth in the Russian Federation. However, Baltika has continued to expand internationally to other markets (such as Turkey, Bulgaria, and Romania) and has increased its exports by 6 % in 2011.

3 Attitude of Baltika towards standardization

An advocate for standards and firm believer of the benefits they bring, Baltika has implemented the following ISO management system standards :

- ISO 9001 on quality management systems (certification took place in 1999),
- ISO 14001 on environmental management systems (implementation started in 2009 and certification took place in 2011),
- HACCP on food safety management systems (fully implemented in 6 out of 10 breweries that were certified between 2009 and 2012),
- ISO 10002 on customer complaints management (implementation took place in 2013),

and is currently implementing OHSAS 18001 on occupational health and safety and FSSC 22000 on food safety[2]. Baltika encourages the use of ISO management standards by requiring their suppliers to be certified against ISO 9001. Baltika heavily relies on over 200 GOST standards for all processes and operations (the most important standards can be found in **Annex 2)**.

Throughout the interviews conducted by ISO, the Baltika staff demonstrated high interest in standards. They mentioned that Dr. Isaac Sheps, the President of Baltika Breweries, has been participating in ISO technical committee 176 that developed the ISO 9000 family of standards on quality management systems. Baltika's quality management department is involved in the development and the review of Russian state technical regulations for beer.

4 Analysis of the value chain

Baltika's value chain extends from the procurement of raw materials to after-sales services of products. The company permanently conducts a quality control at all stages of production and is highly aware of the impacts of its production on the environment and society.

4.1 Industry value chain

The brewery industry value chain can be seen in **Figure 1.**

2) FSSC 22000 (Food Safety System Certification 22000) is a certification scheme for auditing and certification of food safety systems of organizations in the entire food supply chain. The scheme is based on ISO 22000, ISO 22003 and technical specifications for sector Pre-requisite Programs (PRPs) and applicable to all organizations in the food chain regardless of their size and complexity, whether profit-making or not, public or private.

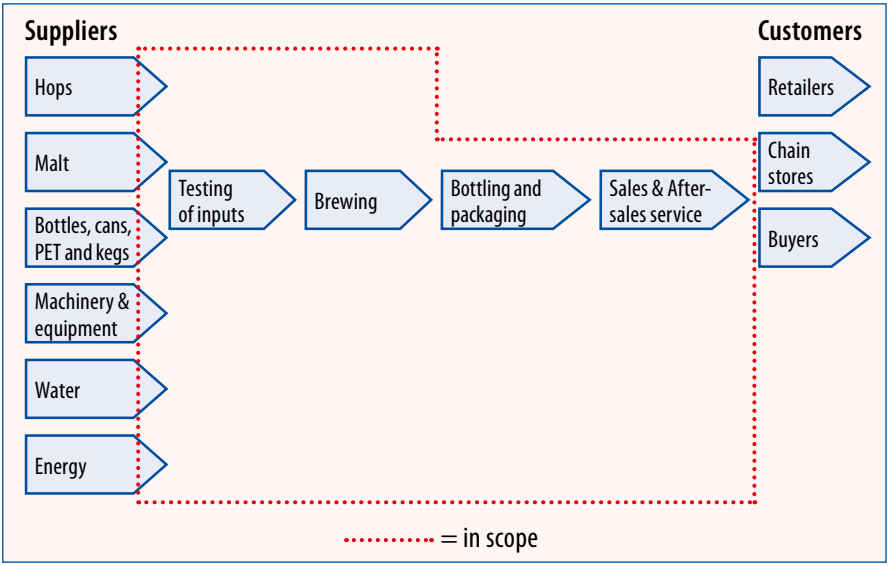

Figure 1 – Value chain of the brewing industry

The value chain is a sequence of processes that involves many actors such as suppliers who provide the necessary input for production and consumers of the final product. The brewery value chain can be seen as a system with various entities providing different services at each step. A single company can rarely execute all the activities indicated in the value chain. Some brewing companies cover a bigger share by producing their own inputs, for example by growing their own barley crops or producing malt, but they still need to purchase resources such as water and energy.

Brewing is relatively simple in terms of input, but requires a long sequence of processes and time (about 2 to 3 weeks) before the beer can be consumed.

4.2 The brewery process : Key stages in beer production

The **Figure 2** gives an overview of the core brewing process from the provision of input to distribution of the final product.

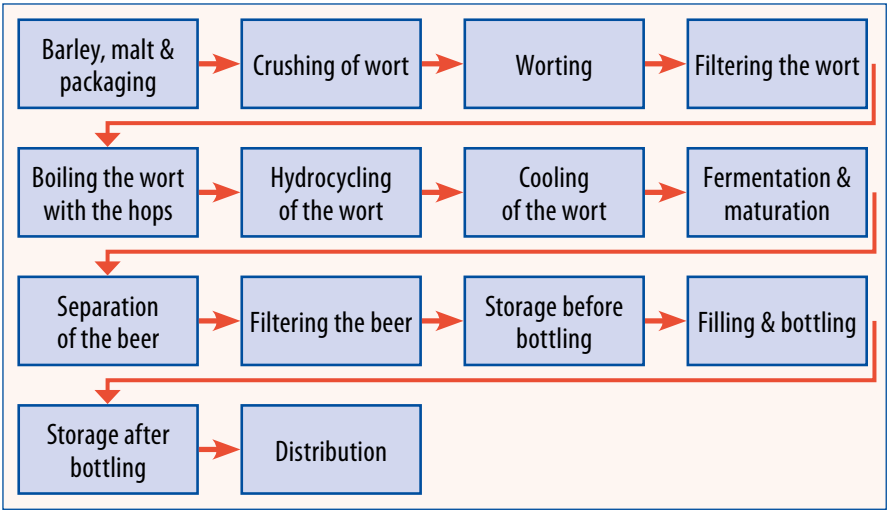

Figure 2 – Key stages in beer production

4.3 Company value chain of Baltika

Michael Porter, professor at Harvard Business School, defined 9 business functions for the company value chain (as seen in **Figure 3)**. The functions labelled A to D (vertically) are supporting functions, and those labelled E to I (horizontally) are called primary functions. The latter comprise activities necessary for the creation of the product or service (in our case – beer), while the supporting functions assist in the manufacturing of the product/service by providing input, technical, managerial or other services (e.g. procurement of barley and hops needed to produce beer).

The key areas of Baltika's value chain most impacted by standards are the following four major business functions : procurement, inbound logistics, production and distribution. The other business functions include after-sales service, marketing and technology.

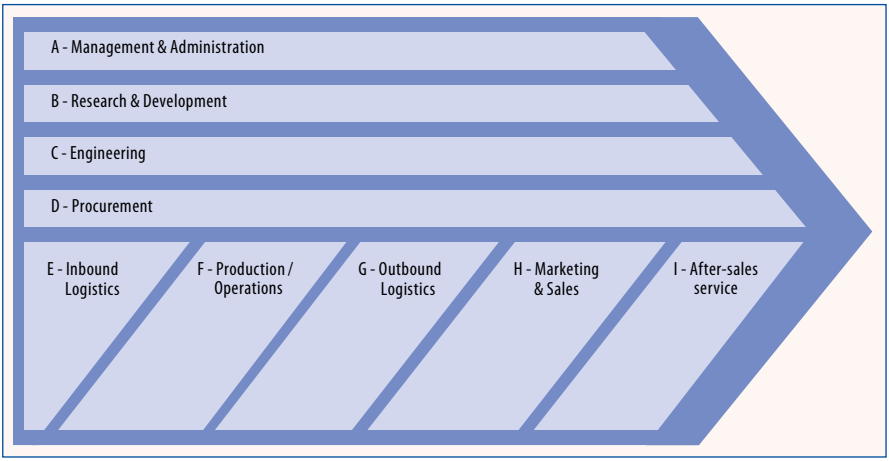

Figure 3 – Baltika Breweries' value chain

4.4 Key business functions in Baltika

Table 2 gives an overview of key business functions in Baltika with some information on important developments in each of them.

Business functions	Activities
Management and Administration	Baltika established a management system on the basis of ISO 9001 in the late 1990s and subsequently transformed this system from being function-based to a process-based system. This increases company efficiency, as it eliminates barriers between functions and guides employee contributions to the chosen strategy. Key performance indicators identified in their three-year strategy allow for better achievement, control and measurement of desired results. Furthermore, Baltika has started a process of integrating ISO 9001 with other management systems such as ISO 14001, OHSAS 18001, FSSC 22000, ISO 50001 and some other standards like ISO 10002. Thanks to the effective management system focused on continual improvement, and on continuous learning and training of employees, 65 % of Baltika's senior specialist levels and high positions were filled by internal promotions. In 2012, over half of Baltika's employees (4500) attended and benefited from training in the Baltika Corporate University, increasing the staff's motivation, productivity and the company's competitive advantage and performance in the long run.
Research & Development	Baltika has a strong R&D function allowing it to continuously develop new types of beer, to provide a wide range of choice to consumers, and address specific market segments and consumer preferences.
Engineering	High-quality of automated production facilities, well maintained and supported with spare parts. Capability to respond flexibly to needs for the production of different types of beer with the equipment set-up.
Procurement	Large network of raw material suppliers, including direct partnership agreements with farming enterprises growing barley in different regions of the Russian Federation. Energy, water and other supplies are ensured through long-term contracts.
Production	Large scale, high-volume automated production chain in various breweries, and strong capability in monitoring and control of processes.
Logistics/Distribution	Extensive and highly-efficient distribution network with a presence in nearly 100 % of retail and many chain stores throughout the Russian Federation and worldwide in over 70 countries.

Table 2 – Key business functions in Baltika

4.5 Value drivers in Baltika

In the course of interviews with Baltika staff, the following areas were identified as key value drivers where Baltika has special competitive strengths as compared to other beer producers:

Ensuring high quality of raw materials and production

Baltika ensures the quality of products by testing the raw materials, by requiring their suppliers to be certified to ISO 9001, by strictly controlling the production process, by testing the final product and by keeping the transport conditions of the final product under strict control.

Each production site has an important laboratory department to check that the product corresponds to set characteristics. This ensures e.g. constant taste (providing the same quality and taste at each site), which is essential for achieving consumer satisfaction, increased loyalty and, consequently, more sales.

Powerful portfolio of brands

Baltika is constantly innovating and developing new types of beer and has currently over 30 brands, all adapted to particular consumer needs. Brands are developed according to market trends, and sold in various forms of packages according to consumers tastes and preferences. The marketing department is vital in developing new ways to increase the visibility and brand image.

Strong consumer focus and customer relationship

Baltika pays particular attention to consumer satisfaction and puts consumer wants and needs at the heart of their strategy. Various complaint channels are in place to respond in a fast and efficient way to consumer claims. Customers, who include buyers like distributors and retail stores are encouraged to express their complaints (and are even rewarded for their contribution, e.g. via discounts), as Baltika

understands the importance of customer satisfaction, which leads to constant improvement of their products.

Extensive and efficient distribution system

Baltika's products are available in 98 % of all retail outlets selling beer in the Russian Federation. In the last few years, it has also increased its market share of " chain store " distribution retailers. These chain stores have become very popular in the Russian Federation. Their prices tend to be cheaper and, therefore, most consumers prefer to shop there.

5 Scope of the assessment

This assessment covers the impacts of standards throughout all of Baltika's production sites and facilities in the Russian Federation. The business functions selected for this study are :

1. Procurement
2. Inbound logistics, including testing of incoming materials
3. Production
4. Warehousing and Distribution
5. After-sales service

Although R&D, marketing and sales functions are critical for the success of Baltika, for pragmatic reasons, it was decided to limit the assessment to the above functions.

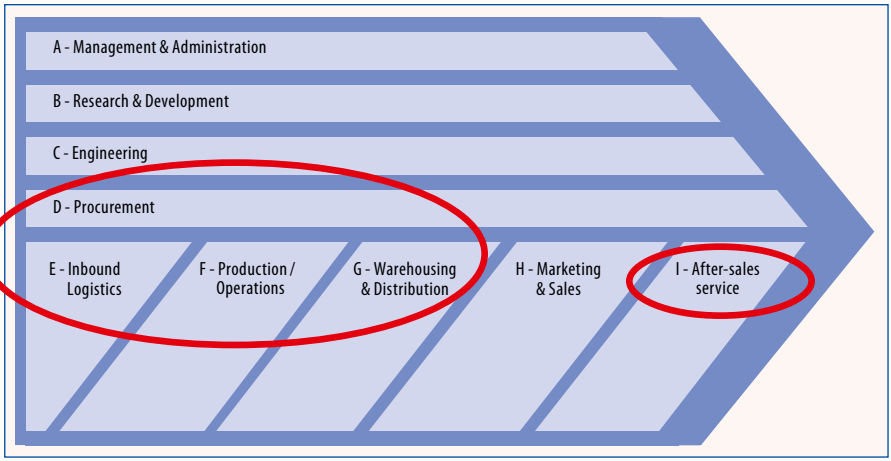

Figure 4 – Scope of the assessment as seen in the value chain

6 Key standards used in the Company value chain

Baltika uses over 200 GOST standards and many ISO standards.

The application of the standards within the selected functions is given in **Figure 5**:

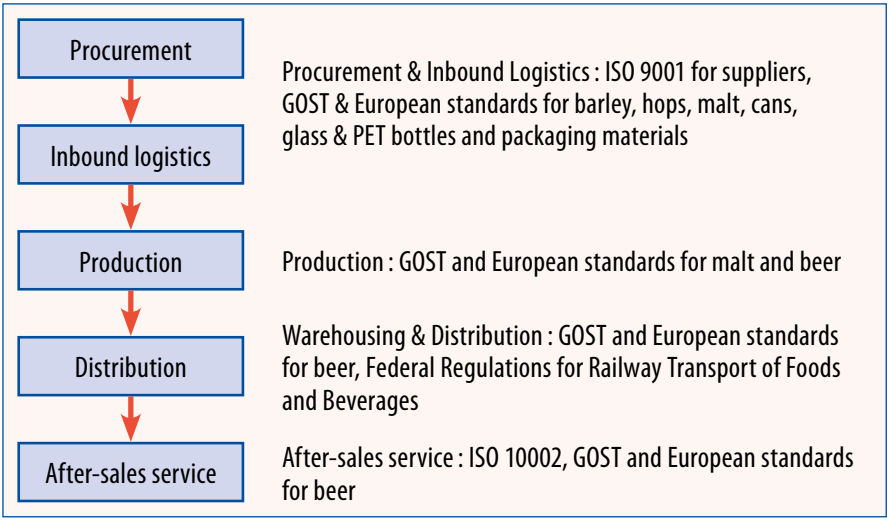

Figure 5 – The Company value chain and key standards used

7 Selection of operational indicators to measure the impacts of standards

Table 3 below lists key operational indicators to measure the impacts of standards for activities in the selected business functions:

#	Business functions	Operational indicators	Explanation of the indicators
1	Procurement	Cost savings due to different procurement activities	Purchase requirements corresponding to European Brewery Convention (EBC) standards
2	Inbound logistics – Testing of Supplied Materials	Reduction of time spent by laboratory workers on testing incoming materials	The company requires suppliers to be certified to ISO 9001; audits are regularly carried out by the company. This allows for better quality of incoming materials and less testing is needed. Consequently, this allows to reduce the time required for laboratory testing
3	Inbound Logistics – Testing of supplied materials	Time of laboratory department employees and company money saved by using GOST and European standards	Without GOST and EBC standards, the laboratory department would have had to develop local standards (about 150)
4	Production	Increase in worker qualification thanks to training	Training, followed by monitoring of its results, leading to an increase in workers' qualification and more efficient performance
5	Production	Savings due to an increase in the productivity of workers	Output in hectolitres of beer produced annually per worker
6	Production	Reduction in thermal energy usage	Reduction in thermal energy in part due to standard (%)
7	Production	Reduction in electricity usage	Reduction in electricity in part due to standard (%)
8	Production	Reduction in water usage for production	Reduction in water in part due to standard (%)
9	Production	Savings due to the optimization of process control through critical control points	Savings due to the integration of critical control points leading to better process control and the reduction of some workers who were diverted to other work
10	Warehousing & Distribution	Stable beer quality on delivery thanks to appropriate transport with minimal cost	Cost reduction for client, retailer and Baltika due to use of their own thermally reconditioned wagons (instead of outsourcing)

#	Business functions	Operational indicators	Explanation of the indicators
11	After-sales service	Reduction in costs of non-conforming products dispatched but not yet sold to consumers	Customers are encouraged to report non-conforming production, allowing the company to order back a batch before it is bought by consumers. This reduces direct costs and costs associated with the loss of brand image

Table 3 – Key operational indicators

Table 4 gives an overview of the most influential standards used in the selected business functions. For additional details on the standards, please refer to **Annex 2.**

Business functions	Related activities	Implemented standards
Procurement	Procurement of barley, malt, hops, cans & bottles, etc.	• GOST 5060 Barley • GOST 29294 Barley malt for brewery • EBC standards for raw materials for brewery • EBC Standard malt • GOST 21947 Hops • GOST 21 Granulated sugar • GOST 10117.1 Glass bottles • GOST 51765 Aluminium cans • etc.
Inbound Logistics & control of purchased materials	Control of barley malt, water, sugar, hops, barley, wheat, wheat grist, rice groats, corn groats etc.	• GOST 29294 Barley malt for brewery • Sanitary Rules and Standards for drinking water : SanPiN 2.1.4.1074 & SanPiN 2.1.4.1075 • GOST 21 Granulated sugar • GOST 21947 Hops • GOST 5060 Barley • GOST R 52554 Wheat • GOST 18271 Ground wheat grist • GOST 6292 Rice groats • GOST 6002 Corn groats

Business functions	Related activities	Implemented standards
Production	Beer brewing	• Sanitary rules and standards on hygienic requirements for safety and food value of food products : SanPiN 2.3.2.1078 • GOST 12787 Beer. Methods for determination of alcohol content and concentration of first wash • GOST 12788 Beer. Methods for determination of acidity • GOST 53070 Beer. Method for determination of pH • GOST12789 & EBC Beer. Methods for determination of colour & EBC Units • GOST 51154 Beer. Methods of determination of carbon dioxide and stability • GOST 30060 Beer. Methods for determination of organoleptic indices and product volume • IK 9184-038-00334600-09 Beer Classification & identification of foreign matter • GOST 26927, GOST 30178, GOST 30538 & GOST R 51823 Determination of mercury • GOST 26930, GOST 30178, GOST 30538, GOST R 51766 & GOST R 51823 Determination of arsenic • GOST 26932, GOST 30178, GOST 30538, GOST R 51301 & GOST R 51823 Determination of lead • GOST 26933, GOST 30178, GOST 30538, GOST R 51301 & GOST R 51823 Determination of cadmium • IK 10-04-06-140 Sanitary microbiological control of beer brewing • GOST R 52816 Methods for detection and quantity determination of coliforms • GOST 52814 Method for the detection of Salmonella • GOST 10444.15 Determination of total bacteria quantity by petri dishes count • GOST 10444.12 Method for determination of yeast and mould • MUK 4.4.4.011 Determination of volatile n-nitrosamines in food raw materials and food products • MUK 2.6.1.1194 Strontium-90 and Cesium-137 in food products. Sampling, analysis and hygienic evaluation • MU 5778 Strontium-90. Determination in food products • MU 5779 Cesium-137. Determination in food products

Business functions	Related activities	Implemented standards
	Control of atmosphere in filling areas	• ISO 14644 Clean rooms and associated controlled environments, Parts 1, 2, 3 & 4
	Bottling	• GOST 8.579 Quantity of packaged materials in all types of packaging
Warehousing & Distribution	Packaging and transportation	• GOST 24597 Unitized tared and piece goods cargoes • GOST 23285 Transportation packages for food products and glass containers. Specifications
After-sales service	Customer complaints	• ISO 10002 Quality management – Customer satisfaction – Guidelines for complaints handling in organizations

Table 4 – Key standards used in the selected business functions

8 Calculation of the economic benefits of standards

On the basis of the operational indicators defined in **Table 3,** the contributions from standards in economic terms have been calculated as shown in **Table 5.** In some instances, the impacts of standards had to be distinguished from other types of impacts. This was often not easy and the estimations for the specific impacts of standards in **Table 5** are based on discussions with and information provided by Baltika staff.

At the request of Baltika, the economic benefits resulting from the use of standards are given in the form of percentage savings and not in absolute figures. These percentage savings represent a proportion of the total costs of the respective business functions.

The total saving for all business functions assessed in this study is a percentage of the total costs of the entire business functions included in the scope of this assessment study.

Business Functions	Implemented standards	Total financial impact on the Business Function
Procurement	Sourcing based on specifications (See table 4)	The application of European Brewery Convention standards allowed to extend the market for the sourcing of raw materials. This resulted in savings of around **2 %** on the purchase of raw materials, packaging materials, marketing and operational services from different suppliers and countries where prices are lower.
Total contribution for procurement:		**Around 2 % of overall savings.**
Inbound Logistics & Testing of purchased materials	GOST ISO 9001 & GOST standards	Reduction in testing of incoming materials, based on the requirement that suppliers should be certified to GOST ISO 9001 led to the diversion of 31 laboratory staff to other work, representing a saving of 18.6 % on the payroll of laboratory personnel. 50 % of this saving is attributable to standards, that is **9.3 %**.
	GOST & ISO standards for testing methods	The existence of GOST, ISO and other standards for the majority of tests led to a saving in the time required by laboratory staff to develop some 150 test methods, had these standards not existed. Estimated saving of work time of laboratory staff is **5 %**. This saving is totally attributable to standards.
Total contribution for Inbound Logistics & Testing of incoming materials:		**About 14.3 % saving on the time of laboratory staff.**
Production : - Labour productivity	GOST ISO 9001 & HACCP	Productivity in hectolitres of beer produced annually per worker rose by 11.5 % between 2008 and 2012. About 60 % of this gain is attributable to standards, that is **6.9 %**.
- Resource consumption	GOST ISO 14001 & ISO 50001	Consumption of electrical energy per litre of beer in kWh per litre was reduced by **8 %** between 2010 and 2012. All of this saving is attributable to standards. Consumption of water per litre of beer was reduced by **13 %** between 2010 and 2012. All of this saving is attributable to standards. Consumption of heat energy in kWh per litre of beer was reduced by **16.1 %** between 2010 and 2012. All of this saving is attributable to standards.
- Hazard Control Points	HACCP	Optimization of Critical Control Points by concentrating on the most important points led to a reduction in the number of test laboratory employees. (This financial impact is included in the impact mentioned under Inbound Logistics and Testing of incoming materials above).
Total contribution for production :		**About 6.95 % saving thanks to productivity increases and savings in the use of electricity, water and heat.**

Business Functions	Implemented standards	Total financial impact on the Business Function
Warehousing & Distribution	GOST standards for beer and other drinks & Federal Regulations for the Railway Transport of Foods and Beverages.	Isothermal reconditioning of railway wagons in line with standards and regulations led to 7 % reduction in the cost of beer transportation by rail. Moreover, this ensures conservation of the beer quality and taste. 50 % of this saving is attributable to standards, that is **3.5 %**.
	EAN Code permitted faster and better access to stores, and a reduction in the number of store employees.	Reduction in number of store employees led to a saving of 7 % in salaries and social charges. 50 % of this gain is attributable to the standard and easily available code readers, that is **3.5 %**.
	EAN code permitted faster acceptance of product in outlets (from 1 hour to 15 minutes), thus reducing associated fines.	Reduction of fines by 70 % in 2012. 80 % of gain is attributable to standards, that is **56 %**.
Total contribution for Warehousing & Distribution :		**About 7.8 % saving thanks to railway wagon refitting, reduction in store personnel and faster reception at retailers as a consequence of the use of standards.**
After-sales service	ISO 10002 & GOST standards for beer and other drinks	Application of ISO 10002 resulted in the collection of valuable customer feedback which, in 2012, allowed to retrieve the bulk of two batches of a slightly defective product before it was sold to consumers. This reduced direct costs related to further processing for sale of these defective batches as well as costs of compensation to customers by 60 %. 80 % of this gain is attributable to the standard, that is **48 %**.
Total contribution for After-sales service :		**About 48 % saving thanks to avoidance of further processing of slightly defective product batches which were retrieved and avoidance of customer compensation.**
Total for all reviewed business functions :		**A total aggregated saving of 5.8 % in all business functions.**

Table 5 – Financial impacts of standards on the selected business functions

The figures of **Table 5** show a substantial **aggregated saving of 5.8 % of the cost of those business functions of the company assessed in this study.**

Expressed as a percentage of the revenue, the **total savings due to standards determined by this study amount to 3.4 % of the annual revenue of Baltika.**

9 Qualitative and semi-quantitative considerations

Apart from the benefits of standards that could be quantified on the basis of available data and estimations by Baltika staff, there are other benefits of standards for Baltika resulting from the use of standards.

These effects were clearly captured throughout the interviews conducted at Baltika.

Such impacts are :

- The implementation of FSSC 22000 standard and its prerequisite programs has enhanced control of the production process resulting in stable, high quality and safety of food, as well as customer and consumer satisfaction.
- Research and development of new types of beer and packaging based on GOST standards played an important role in developing and introducing new products adjusted to consumer tastes and needs, thus conserving Baltika's market share under difficult market conditions.
- Constant investment in worker's safety by implementing ways to reduce the number of accidents and injuries at the workplace through systematic use of OHSAS 18001.
- Company standards, based on GOST, regional and international standards allowed flexible redistribution of production and sales

of products to different regions that were the most profitable for the company by means of a computerized optimization tool.

- Optimized information exchange through implementation of the ISO 9001 management system saved time of the employees and led to higher transparency and sharing of responsibility between managers, as well as better work discipline.
- Integration of the management systems resulted in a reduced number of corporate documents and the creation of one-page abridged versions of corporate normative documents, limited to key information needed specifically at particular work-sites.
- Due to increased awareness of its environmental impacts and implementation of ISO 14001, Baltika was able to reduce its environmental risk. Lesser environmental damage resulted in fewer penalty sanctions and a better reputation of the company.
- Reduction of CO_2 emissions: This is an environmental benefit that is currently not regulated in the Russian Federation, consequently the reduction has no direct financial benefit for the company, but helped Baltika to fulfil Carlsberg Group policies on CO_2 emission reduction.
- Using returnable bottles as much as possible is also a way to reduce environmental impact.
- Use of EAN-standard permitted easier tracing of products sold on the market thanks to barcodes and the company's traceability system, resulting in corrective/preventive action and improved quality. Additionally, the use of the EAN-based barcode and traceability system led to more efficient warehousing with fewer employees.

10 Evaluation of the results

The quantitative benefits of the implementation of standards in Baltika are evident and amount to a saving of 5.8 % for all business functions during the period between 2008 and 2012. Expressed as a percent-

age of revenue, the savings represent 3.4 % of the annual revenue. In view of the huge expenditure and turnover of the company, the financial benefits in absolute terms are relatively high.

The largest benefits from the use of standards occur in the following business functions :

- Production : about 7 % owing to an increase in productivity of workers and savings of electrical energy, heat and water use per litre of beer
- Procurement : about 2 % of the value of purchased materials and services
- Inbound Logistics & Testing of incoming materials : about 14.3 % owing to the saving in time and effort needed to develop test methods of incoming materials and in-process testing due to the availability of standard test methods, as well as a reduction in incoming materials testing thanks to enhanced confidence in suppliers certified to GOST ISO 9001.

NOTE : The percentage values of savings for each business function are not directly indicative of the money value of the savings, since the costs of the business functions are very different.

11 Conclusions

The substantial financial gains observed in Baltika Breweries prove that the implementation of consensus-based national, regional or international standards and of relevant regulations affecting beer production, has led to gains exceeding by far any cost or effort associated with the development and/or the implementation of these standards.

ANNEX 1 : Participants in the study

Participants from Baltika Breweries :

- Mr. Dmitry Vizir, Director of Quality Management
- Mr. Ivan Kurdyumov, Director of Operations
- Mr. Andrey Nazarov, Director of Logistics
- Ms. Ave Salupuu, Acting Director of Procurement
- Mr. Alexander Ivashkin, Head of Quality Management Department
- Ms. Zhanna Perevoshikova, Leader of Quality Management (9001)
- Ms. Anna Dukhovskaya, Leader of Environmental Management (14000)
- Mr. Alexander Ekimov, Leader of Health, Safety and Environment (18000)
- Mr. Kirill Kuptsinelli, Head of Production Laboratory, St. Petersburg (22000)
- Mr. Oleg Volkovsky, Senior Manager of Customer Complaints (10002)

Participants from GOST R :

- Mr. Evgeny Petrosyan
- Ms. Olga Samoilova

Participants from ISO :

- Dr. Anwar El-Tawil, Consultant
- Ms. Ksenia Kouzmina, Consultant
- Mr. Reinhard Weissinger, Project advisor, ISO Central Secretariat

ANNEX 2 : Standards and regulations used by Baltika (not exhaustive)

1. Federal Law of 22.0.2000, № 29-FZ on the quality and safety of food products.
2. Federal Law of 30.03.1999, № 52-FZ on sanitary-epidemiological well-being of the population.
3. Federal Law of 27.12.02, № 184-FZ on technical regulation.
4. Technical Regulation of the Customs Union 021/2011 on the safety of food products.
5. Technical Regulation of the Customs Union 005/021 on the safety of packaging (with changes of 15 June 2012).
6. SanPiN 2.1.4.1074 – 01 Sanitary rules and standards for drinking water from central drinking water systems – Quality control.
7. SanPiN 2.1.4.1110-02 Drinking water and water supply of populated areas. Zones of sanitary protection of sources of water supply and water pipes for drinking purposes.
8. SanPiN 2.3.2 1078 – 01 Hygienic requirements for safety and food value of food products.
9. Sanitary-epidemiological rules and standards. (with changes of 15 June : № 2 SanPiN 2.3.2.1280-03 ; № 5 SanPiN 2.3.2.2227-07 ; № 6 SanPiN 2.3.2.2340-08 ; № 7 SanPiN 2.3.2.2351-08 ; № 8 SanPiN 2.3.2.1280-03 ; №10 SanPiN 2.3.2.2401-08 ; №11 SanPiN 2.3.2.2421-08 ; №13- SanPiN 2.3.2.2430-08, №12 SanPiN 2.3.2.2422-08 ; №14 SanPiN 2.3.2.2509-09).
10. SanPiN 2.3.2 1280-03 Hygienic requirements for safety and food value of food products. Supplements № 2 to SanPiN 2.3.2.1078-01.
11. SanPiN 3.2.5.1376 – 03 Sanitary-epidemiological requirements for the organization and carrying out of disinfection measures against synanthropic arthropods.

12. SP 1.1.1058 – 01 Organization and carrying out of production control of observance of sanitary rules and carrying out of sanitary anti-epidemiological (prophylactic) measures (with changes and supplements №1 – SP 1.1.2193-07).

13. SP 2.1.5.1059-01 Hygienic requirements for the protection of underground water from pollution.

14. SP 3.5. 1378 – 03 03 Sanitary-epidemiological requirements for the carrying out of disinfection activity

15. SP 3.5.3.1129 – 02 Sanitary-epidemiological requirements for the carrying out of deratization.

16. SP 2.3.6.1079-01 Sanitary-epidemiological requirements for the organization of public restorations, preparation of food and the convertibility of food products and food raw materials (with changes of 31 March 2011).

17. Sanitary rules for enterprises of the brewing industry and the industry of non-alcoholic beverages (approved by the Ministry of Health of USSR 09.04.1995 №3244-85).

18. SP 2.5.1250-03 Hygiene and epidemiology in transport standard rules for the organization of transport of loads by railway. Sanitary-epidemiological rules (with changes № 1, 2).

19. SP 44.13330.2011 Collection of rules. Administrative and residential buildings (updated version SNiP 2.09.04-87 Administrative and residential buildings).

20. SP 52.13330.2011 Collection of rules. Natural and artificial lighting (updated version SNiP 23-05-95).

21. SP 56.13330.2011 Collection of rules. Production buildings (updated version SNiP 31-03-2001).

22. SP 29.13330.2011 Collection of rules. Floors (updated version SNiP 2.03.13-88).

23. SP 30.13330.2012 Collection of rules. Internal piping and drainage of buildings (updated version SNiP 2.04.01-85).

24. SNiP 3.05.01-85 Building standards and rules. Internal sanitary – technical systems (with changes №1).

25. SNiP 3.01.01-85 Building standards and rules. Organization of building production (with changes № 1, 2).

26. SNiP 2.04.05-91 Building standards and rules. Heating, ventilation and air conditioning (with changes № 1, 2, 3).

27. SNiP 12-04-2002 Building standards and rules. Labour safety in construction. Part 2 : Building construction (replacing Decree № 82 of Gosstroy of the USSR of 9 June 1980 in the parts 8-18 SNiP III-4-80 Safety techniques in building construction [with changes 1-5]).

28. SNiP 3.01.04-87 Building standards and rules. Reception for use of finished constructions. Basic rules (with the entry into force of SNiP 3.01.04-87, SNiP III-3-81 Reception for use of finished constructions. Basic rules are no longer valid).

29. GOST R 51074-2003 Food products. Information for consumer. General requirements.

30. GOST R 51174-2009 Beer. General specifications (with change №1).

31. GOST R 51154 98 Beer. Methods of determination of CO_2 and stability.

32. GOST R 51301-99 Food and food raw materials. Methods of inversion volt-amperometric determination of the content of toxic elements (cadmium, lead, copper and zinc).

33. GOST R 51832-2001 Alcoholic beverages and raw materials for their production. Inversion volt-amperometric method for the determination of cadmium, lead, zinc, copper, arsenic, mercury, iron and total sulphur dioxide.

34. GOST R 51766-2001 Food raw materials and food products. Atomic absorption method for the determination of arsenic.

35. GOST R 52554-2006 Wheat. Technical conditions.

36. GOST R 52814-2007 Food products. Method of detection of salmonella.

37. GOST R 52816-2007 Food products. Method of detection and determination of the quantity of coliform bacteria.

38. GOST R 53070 Beer. Determination of ph.

39. GOST R 53358 Brewery products. Terms and definitions.

40. GOST 8.579-2002 State system for the assurance of the unity of measurements. Requirements for the quantity of packaged products and packages of all types during production, packaging, sale and import.

41. GOST 21-90 Granulated sugar. Technical conditions.

42. GOST 5060-86 Barley for brewery. Technical conditions.

43. GOST 6002-69 Corn groats.

44. GOST 6292-93 Rice groats.

45. GOST 10444.12-88 Food products. Method of determination of yeast and mold.

46. GOST 10444 Food products. Methods of determination of the quantity of mesophilic aerobic and optionally anaerobic microorganisms.

47. GOST 12786-80 Beer. Rules for the reception and drawing of samples.

48. GOST 12787-81 Beer. Methods of determination of alcohol, effective extract and calculation of dry matter in the initial wort.

49. GOST 12788-87 Beer. Methods of determination of acidity.

50. GOST 12789-87 Beer. Methods of determination of colour.

51. GOST 14192-96 Marking of loads.

52. GOST 18271-72 Wheat cut groats. Technical conditions.
53. GOST 21947-76 Pressed hops. Technical conditions.
54. GOST 23285-78 Packages with flat bottom. Food products and glass bottles. Technical conditions.
55. GOST 24597-81 Packages of single tare loads. Basic parameters and dimensions.
56. GOST 26927 Food raw materials and products. Determination of mercury content.
57. GOST 26930-86 Food raw materials and products. Determination of arsenic content.
58. GOST 26932-86 Food raw materials and products. Determination of lead content.
59. GOST 26933-86 Food raw materials and products. Determination of cadmium content.
60. GOST 29294-92 Brewery barley malt. Technical conditions.
61. GOST 30060-93 Beer. Determination of organoleptic indicators and the volume.
62. GOST 30178-96 Food raw materials and food products. Atomic absorption method for the determination of toxic elements.
63. GOST 30538-97 Food products. Determination of toxic elements by atomic emission
64. GOST R 52249-2009 Good manufacturing practice for medicinal products (GMP).
65. GOST R 51251-99 Air filters. Classification. Marking.
66. GOST R ISO 7730-2009 Ergonomics of the thermal environment – Analytical determination and interpretation of thermal comfort using calculation of the PMV and PPD indices and local thermal comfort criteria.

67. GOST R 12.4.026-2001 Occupational safety standards system. Safety colours, safety signs and signal marking. Purpose and rules of application. General technical requirements and characteristics. Methods of tests.

68. GOST 9238-83 Construction and rolling stock clearance diagrams for the USSR railways of 1520 (1524) mm gauge.

69. GOST R 51870-2002 Domestic services. Services for cleaning up of buildings and constructions. General specifications.

70. OST 42-510-98 Rules for the organization of production and quality control of medicinal products (GMP).

71. OST 26-5-99 Branch standard. Non-destructive testing. Colour method of control of welded joints, added and base Metal.

72. R 2.2.2006-05 Occupational hygiene. Guidance for hygienic evaluation of factors of the work environment and labour process. Criteria and classification of work conditions.

73. Decree № 90 of 14.03. 96 on the way of carrying out first and periodic medical examination of workers and medical regulations for permitting to practice a profession.

74. Regulation (EC) № 852/2004 of the European Parliament and Council of 29 April 2004 on sanitary – hygienic rules for the production of food products.

75. GOST R ISO/TS 22002-1:2009 Prerequisite programmes on food safety – Part 1 : Food manufacturing.

76. ISO 14644-1:2002 Clean rooms and associated controlled environments – Part 1 : Classification of air cleanliness.

77. ISO 14644-2:2001 Clean rooms and associated controlled environments – Part 2 : Specifications for testing and monitoring to prove continued compliance with ISO 14644-1.

78. ISO/FDIS 14644-3 Clean rooms and associated controlled environments – Part 3 : Test methods

79. ISO 14644-4:2002 Clean rooms and associated controlled environments – Part 4 : Design, construction and start-up.

80. GOST R ISO 14644-5-2005 Clean rooms and associated controlled environments – Part 5 : Operations (approved and brought into force by the Decree of the Federal Agency for Technical Regulation and Metrology of 11 March 2005 N 48, p. The current standard is identical to International Standard ISO 14644-5:2004 " Clean rooms and associated controlled environments – Part 5 : Operations ").

81. EN 1672-2, 2nd version. Food processing machinery – Basic concepts – Part 2 : Hygiene requirements.

82. PAS 96:2010 Defending food and drink " Guidance for the deterrence, detection and defeat of ideologically motivated and other forms of malicious attack on food and drink and their supply arrangements ".

83. MUK 2.3.2.971-00 Method of carrying out sanitary-epidemiological expertise of technical documents on food products.