Systain
Systematic Solutions for Sustainability
Member of the Otto Group

SLN TEKSTİL
VE MODA SAN.TİC.LTD ŞTİ

Carbon Footprint Report

2009

Carbon Footprint
assessed by systain

Hamburg, 21st of December 2009

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1. Introduction

The effect of global warming causes significant disturbances of the global climate such as floods, droughts, rising sea-level, storms, scarcity of water, bad harvests and lost of plants. The International Panel on Climate Change (IPCC) has revealed the scientific significance and proven evidence that the increasing level of carbon emissions by human activity is the major driver of climate change. The IPCC is the nominated United Nations' body for research on this issue.

Consuming fossil fuels such as oil, coal and gas has dramatically risen in the past century with releasing carbon emissions (CO_2) into the atmosphere. Additionally, woods and ecosystems, which absorb CO_2 by the photosynthesis, have been destructed and polluted. The global consumption of energy is continually rising due to the global growth of welfare. Therefore, it is necessary to reduce CO_2-emissions globally in order to avoid major threats to ecosystems and human health. Furthermore, a rapidly rising demand of energy cannot be met by the existing fossil fuels. This development has another economic impact: a rising level of prices for fuels and energy. Scientists and political leaders try to solve this problem by:

- setting up a global framework on reducing carbon emissions,
- promoting a more efficient use of energy,
- expanding renewable energies and
- stimulating the development of new technologies such as low-emission cars.

Companies are faced a growing concern among consumers about what producers and retailers do to reduce carbon emissions and whether they offer products and services with causing less emissions. Additionally, prospected political regulations on carbon emissions, increasing importance of issues related to energy-efficiency among investors and finally the rising prices for energy imply financial risks of companies which do not address this issue within their management at all. Companies, however, that take an active role in corporate environmental responsibility will also benefit for their own business by reducing cost, by managing risk, by setting up management-practices ahead of regulations and above all meeting the demands of their clients.

2. Objectives of the project

Systain Consulting has been assigned to evaluate the carbon emissions of SLN Tekstil in Istanbul. Purposes of SLN Tekstil for this project are:

- to have detailed and accurate information with regard to the Carbon footprint and its relation to the sustainability,
- to get the calculated GHG emissions and reduction recommendation,
- to use the obtained information in SLN sustainability report
- to respond the will of their main customer with regard to subject that Puma would like to create awareness on the topic of sustainability issues that covers the Carbon Footprint.

3. Scope, Data, and Methodology

The carbon footprint indicates the amount of greenhouse gases for a company or a product. The carbon footprint includes all climate-related emissions (GHG). Beside carbon emissions, the carbon footprint includes e.g. methane and nitrous oxide which are further greater greenhouse gas with an even larger impact than CO2 has.

The carbon footprint evaluation in this report includes the direct emissions at the premises of SLN Tekstil and transport-related processes for delivering commodities and for transporting the workers by a contracted bus-service. Also the indirect emissions related to the consumption of electricity are included. Therefore, the carbon footprint evaluation covers the so-called emissions of Scope 1 and 2 according to the categories of the Greenhouse Gas Protocol (GHG-Protocol).

The GHG-Protocol is the most widely used international accounting standard for government and companies to understand, quantify and manage greenhouse gas emissions. It has been developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD).

The results provide the amount of all greenhouse gas emissions according to the GHG-Protocol. Therefore, the amount of the carbon footprint is given in kilogram/tons CO_2equivalents (CO_2e).

4. Carbon Footprint project study results

4.1. Data Collection and Quality of Data

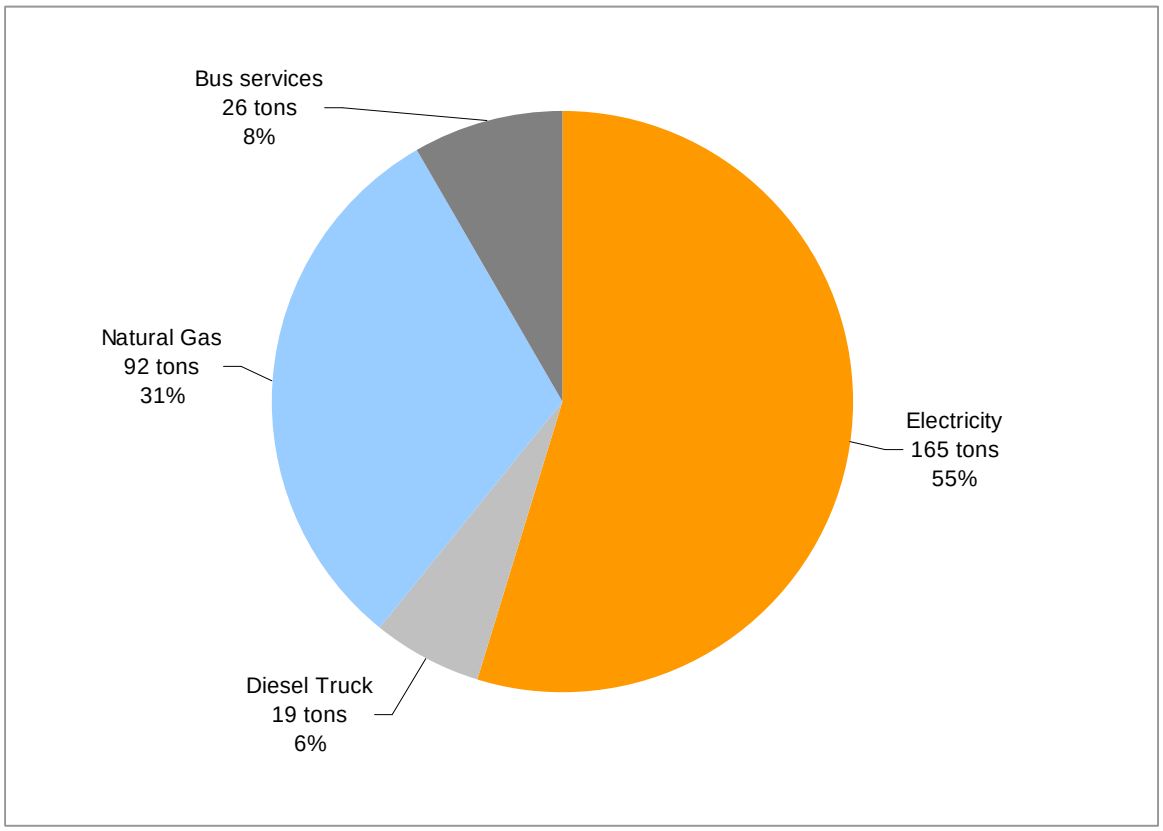
SLN Tekstil was visited in October 2009 by Systain in order to discuss the issue and the project, to clarify methodological requirements for the data collection and discuss the various measures that have already be taken by the pro-active CEO of SLN, Selin Gür, in order to save natural resources. Data of all consumed fuels, energy sources and electricity have been provided by SLN Tekstil, also the data for the transportation of staff. The data have been given for a period of 14 months from Sept 2008 to Oct 2009 on a monthly basis. The evaluation, however, covers the data from Nov 2008 to Oct 2009 in order to provide the amount of emissions for a period of one year. The data have been double checked in order to assure data quality. The quality of the data is good, all data are consistent and plausible.

4.2. Absolute Carbon Footprint

The absolute carbon footprint of SLN Tekstil garment factory in 2009 (12 months Nov 08 – Oct 09) accumulate to an amount of 301.9 tons CO_2e.

The total amount is equivalent to the yearly per capita emissions of 84 citizens in Turkey (3.6 tons per year) or 31 citizens in Germany (9.7 tons per year).

Most of the emissions result from electricity. Heating by the natural gas-fired boiler makes up 92 tons CO_2e, which is almost one third of the total CO_2e emissions. Natural gas causes less emission than coal or other fuels. Transport emissions accumulate to an amount of 45 tons CO_2e, caused by the truck fleet as well as by bus services for workers.



Share of CO_2e-emissions SLN Tekstil in 2009

In the past years, various companies include indirect emissions from extraction and processing of energy sources into the calculation of their own carbon footprint. If these upstream-emissions are included, the absolute carbon footprint of SLN Tekstil would be 385.6 tons CO_2e in 2009.

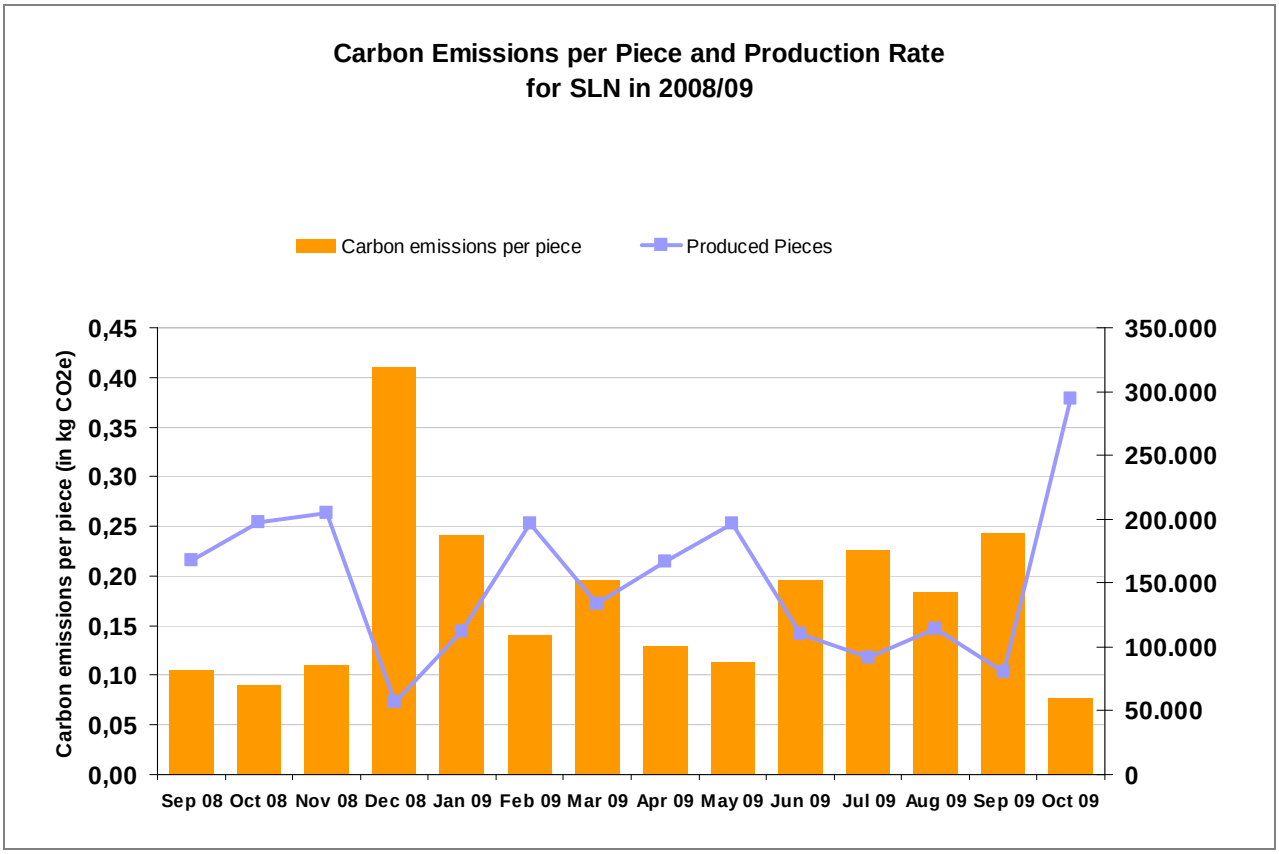
4.3. Relative Carbon Footprint

Approx. 157 grams CO_2e is the carbon footprint per piece for SLN Tekstil garment factory incl. all energy sources. Without considering transport emissions, the carbon footprint per piece is 104 grams CO_2e.

Benchmarking this result with the carbon footprint per piece of other garment factories, SLN Tekstil is actually at the very top. With regard to the fact that SLN garment unit includes an ironing section, SLN shows a very advanced level of energy efficiency.

This result demonstrates the permanent efforts of SLN to manage environmental as well as social issues in a highly professional and comprehensive approach. It should be noted that size of the company, ratio of in-house production and the production rate have an impact to the result – independent how much efforts are taken by the management to increase energy efficiency. The picture illustrates the effect of the production rate of SLN

on the emission level per piece at SLN. Regular energy consumers, which are independent from production rate such as administration, heating, exterior lighting etc., heighten the emission performance per piece in periods of low production. This fact is especially evident by comparing December with a low production rate with October having peak-production.

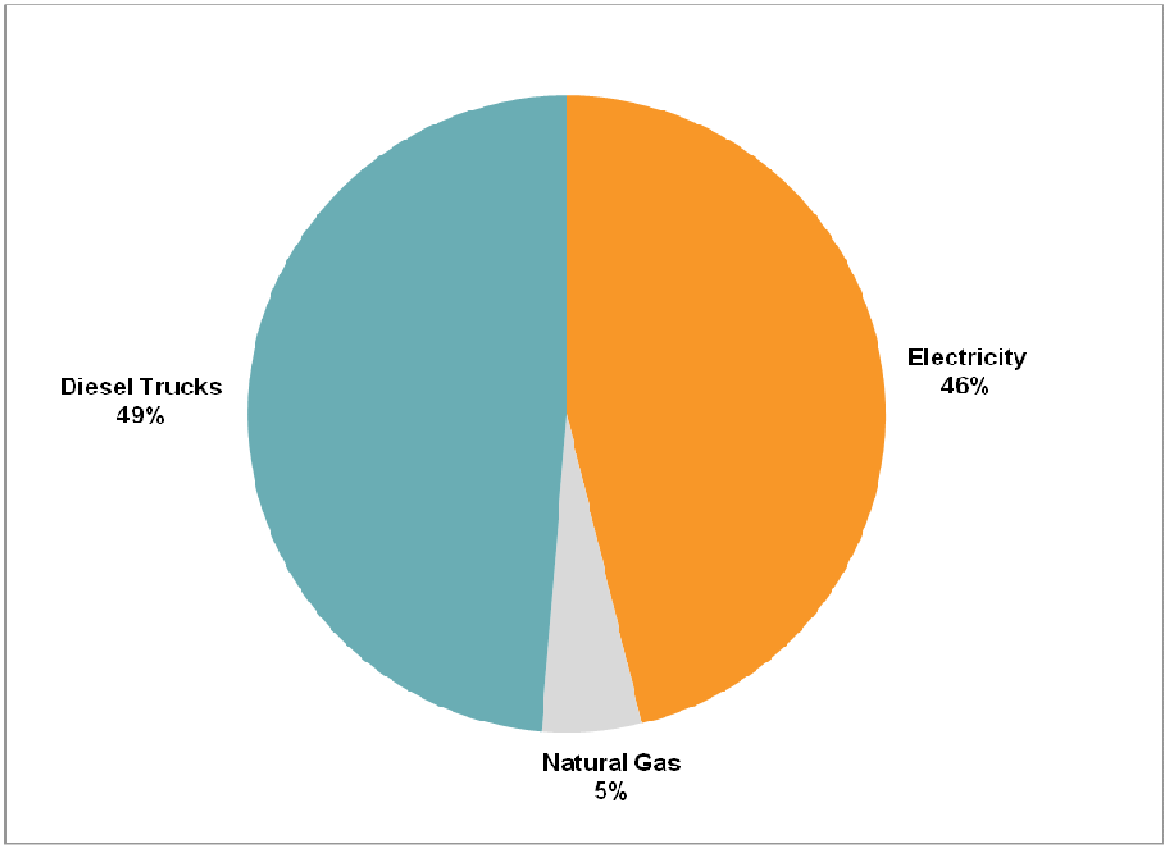


4.4. Energy Consumption and Cost

Since carbon emissions are released by the consumption of energy, the issue is also linked to costs for electricity, fuels and energy. Reducing CO_2e-emissions means for any company also reducing energy costs. For that reason, energy costs have been made transparent.

SLN Tekstil pays an annual amount of 192,300 YTL for energy (without the bus transportation for the workers). About one half is related to the production with an amount of almost 100,000 YTL. The energy costs per piece accumulate to 0.11 YTL.

The Diesel consumption of the truck fleet has only minor effect on the carbon footprint but a major significance on the energy costs of SLN as the table illustrates.



Share of Energy costs SLN Tekstil in 2009

Both, the table on carbon emissions as well as the one on energy costs show that also transportation are a major contributor in terms of emissions and costs.

Reducing 10% of carbon emissions

- of electricity means saving almost 9,000 YTL on costs for electricity
- of natural gas means saving almost 1,000 YTL on costs for gas
- of Diesel for trucks means saving 9,400 YTL on costs for Diesel

An objective of 10% is a reasonable goal which usually can be achieved with 2-3 years if a permanent improvement process has been run. Note that the assumptions are made on the basis of today's energy price-level and investment costs need to be considered.

5. Recommendations

SLN Tekstil has already a very high level of energy efficiency and carbon emissions. This performance results from the permanent strive of SLN for optimizing the consumption of energy and resources. For example different lighting arrangements were tested for balancing efficient energy consumption, light conditions for the quality and beneficial atmosphere for the workers. SLN has carried out measures for raising awareness among the staff for energy-related issues. Steam is re-used by SLN in order to save the heat. Also the heat is displayed for each individual workplace at the ironing

section. Connection plug boards are already used, the administrative departments is encouraged to switch of electronic devices such as screens.

Appropriate management processes are already in place. Even a specialist was mandated to evaluate potentials for saving energy at the boiler and the lighting. **It is suggested to continue the existing processes and practices by purpose and also to intensify the awareness-raising among the SLN-staff especially the administration.**

Due to the fact, SLN is already on a high level of optimized energy use, only few new measures that can be considered are suggested:

- Assuring that (low-energy) electronic ballasts are used for all tubes
- Automatically dimming: technical solutions to dim the light automatically (or manually with a fitting light switch) may be checked. The electronic control arranges the same lighting conditions during the day depending on the natural day light. However due to the building structure, there may be only few rooms at the floors where that solution may make sense
- Checking the use of T5- or even TLD-tubes which are more efficient for producing the same lighting conditions but may need new tube fixture
- Using the waste heat of the boiler by an heat-exchanger
- Considering the installation of a low-temperature boiler combined with a second condensate (recovering the heat of the flu) additionally to the primary heat-exchanger

Due to the large portion of the energy costs and also to the release of CO_2e-emissions the logistic processes as well as the trucks should be included into a systematic process of improvements. Measures that could be considered are:

- renewing the truck-fleet, eliminate elder cars of the fleet
- providing trainings for drivers for efficient driving – a fuel efficient driving can save around 10-20% if practiced continually by the drivers
- avoiding light or empty running by evaluating the organizing and planning processes of transportation if possible
- installing air-deflecting devices (spoiler) at the trucks to improve aerodynamics (if the trucks run on routes with speed above 50 km/h)
- checking the tire-pressure regularly since a under-pressure of one bar means 30% higher rolling friction of the tire which means an extra fuel-consumption of 5%. Moreover, lower pressure than recommended also causes higher abrasion of the tires

- using fuel-efficient engine oil instead of conventional fuel-oils (if available) – the use of such an oil saves fuel consumption by 5%.

Hamburg, 21st of December 2009

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