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GREENHOUSE GAS MANAGEMENT ALONG THE SUPPLY CHAIN AT SIEMENS

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ABSTRACT

At Siemens, activities for climate protection address the entire value chain. The supply chain emits four to six times more greenhouse gases (GHG) than its own manufacturing operations. Obviously Siemens has less influence on the GHG emission of the supply chain than on its own activities. To integrate the supply chain in the climate protection activities Siemens supports its supplier to reduce energy consumption and GHG emissions by implementing the Energy Efficiency Program for Suppliers (EEP4S). (Siemens, 2011)

The aim of the EEP4S is to involve suppliers into Siemens' sustainability strategy and help them to conserve energy. Optimization potentials in environmental and energy efficiency summarized in a comprehensive report encourage Siemens suppliers to contribute on a green supply chain.

INTRODUCTION

With the Code of Conduct Siemens lays the foundations for the evolution of a sustainable supply chain. By accepting the Code suppliers have undertaken the commitment to implement an environmental management system to improve efficiency and reduce emissions. The successful Energy Health Check for the own operations was used as blue print for the development of the EEP4S. (Siemens, 2013 a)

The EEP4S is a corporate program aimed at greening Siemens' supply chain and bringing transparence into the suppliers' processes. Transparency and awareness are the pre-condition for energy and environmental optimization. EEP4S provides a vital foundation of knowledge in the form of several questionnaires, methodologies and reports. Taking the variety of our supplier base into account a 4-level concept has been developed. Levels 1 and 2 involve a graded consulting approach in which certified energy consultants examine the energy and environmental efficiency of a production site. Level 3 and level 4 form the sustainability approach with a web-based self assessment and is also part of the supplier development process. Both levels (3 and 4) determine the GHG emissions of the location for a certain reporting. In addition, the result of level 3 contains a star evaluation (from 1-5 stars) and a top measure report which gives a statement of an average energy saving potential in percent. Level 4 provides an Eco-Care-Point ranking (1-10 points). In the following sections, levels 3 and 4 are described.

MATERIALS AND METHODS

For the implementation of the supplier development and self-assessment levels 3 and 4, the sustainability and reporting software "SoFi software package" from PE-International is used. SoFi is a sustainability and reporting software which has been customized for the EEP4S program. Siemens has integrated the questionnaires, the methodology, the reports, workflow management and the look and feel based on the framework prepared by SoFi. Selected strategic suppliers are provided with a login. Before the suppliers can start with the data acquisition they have to accept the terms of use. The finished data acquisition triggers a comprehensive report which is created and published online. A YouTube video, manuals, embedded explanations and a contact email address are provided as supporting documents.

Level 3 consists of four questionnaires, three qualitative questionnaires and one for GHG calculation: The GHG Questionnaire captures GHG-relevant sources e.g. energy consumption, input materials and waste. Based on the input figures given by the supplier, Scope 1, 2 and 3 GHG emissions are calculated according to the GHG protocol (WRI, 2004) considering different regional CO_{2e} factors, and reported to the suppliers. Due to the fact the main focus is on reduction of emissions and energy, three different regional GHG emissions factors are considered as sufficient: Europe, Asia and the Americas. In this way CO_2 emissions can be compared within one commodity and one region. The CO_2 factors are taken from the life cycle assessment software, "GaBi" (PE-International, 2013) from PE-International and are weighted according the regional split of Siemens suppliers. Scope 1 and 2 related emissions are mandatory fields in the questionnaire, whereas Scope 3 emissions related input and output materials are optional. The results are the GHG emissions separated into the appropriate scopes for the specific location and reporting period. The Energy Management Questionnaire addresses categories of energy policy, controlling and reporting. Energy consuming utilities for the production and administration are considered in the Energy Technique Questionnaire. The Environmental Questionnaire takes GHG reductions strategies into account. As a result of all qualitative questions, the supplier receives a 1-5 star rating. Every star's value represents a certain amount of a saving potential. Finally, the suppliers receive a report of their environmental and energy performance with recommendations to improve their performance.

Level 4 is a basic environmental-only assessment which consists of 2 questionnaires: the GHG questionnaire which covers Scope 1 and 2 emissions and 10 environmental related questions. The level 4 results contain the GHG emissions and an Eco-Care-Point-ranking (1-10 points).

The assessment is valid for a specified reporting period defined by Siemens. The Stars Evaluation and the Eco-Care-Points are a Siemens patented methodology. The methodology considers plausibility checks. In some places plausibility checks are partially integrated into the methodology while others are done additionally after the data acquisition. In some cases answers have to be backed up with corresponding documents, for example certificates, guidelines, otherwise evaluation cannot be completed. In the technical energy questionnaire, the methodology considers an automated and integrated plausibility check. Additionally, at the end of each data acquisition process, a plausibility check with a defined range of minimum and maximum values visualizes potential out of reasonable range. In this case, the supplier is asked to edit or confirm the figures. To generate the report is only possible if all values have passed the plausibility check.

Afterwards the reports are sent to the supplier. Two reports (stars evaluation and GHG report) are generated online the third (top measure report) is generated by an internal Excel-VBA-tool. The report contains recommendations for actions which help the suppliers to improve their energy and environmental performance. Furthermore the potential savings are presented in concrete percentages and ranked into low, medium and high impact.

RESULTS

By the end of 2012, more than 1000 suppliers had finished a self-assessment for one production site and/or building infrastructure each. The potential savings identified speak for themselves: Roughly 18% of the self-assessments have potential to save 14 to 20% energy and another 56% show potential for a 9 to 14% reduction potential for energy saving. Another 1,000 suppliers are due to be integrated into the program in fiscal year 2013. Siemens continues the assessments for the remaining suppliers and will repeat the assessment every two years, which enables Siemens and its suppliers to analyze a time series of energy efficiency increase.

In the next step Siemens will convene about 60 suppliers for supplier meetings to discuss and assess the achieved results together. Aim is to define objectives for improvement and where necessary or requested make contact with Siemens specialists whose experts can help the suppliers to analyze results in detail and implement the ensuing measures. These activities will be embedded into the standardized Siemens supplier management system. Facing an all over savings potential of approximately 5 million tons of CO_2 equivalents relating to 1000 suppliers it is obviously worthwhile to encourage and to force our suppliers to implement suitable measures. (Siemens, 2013 b).

The GHG emissions from the supply chain can be disclosed as part of Siemens Scope 3 reporting. For that reason, Siemens asks for the suppliers' revenue in order to determine and report the equity share. Furthermore, the GHG Emissions per Euro can be used for benchmarking within a region and commodity for plausibility checks.

DISCUSSION

The self assessment itself is holding uncertainty in the process of data acquisition. Encountering wrong answers, typing mistakes, misunderstanding questions can lead to faulty determining factors, not to be detected by the automated and final plausibility checks. Siemens is pretty aware of these uncertainties as well as of its chances and is continuously working on improvements and wherever meaningful seeking the dialogue with suppliers and stakeholders deliberately.

The actual energy saving potential will be visible after the second reporting period when a time series can be displayed and actual improvements can be estimated based on the answers in the qualitative questionnaires.

In the first step Siemens focused on creating transparency knowing well this does de facto not save any kg of CO_2e. Having started a development program for suppliers and working hard on improving the self-assessment tool Siemens can accept the described uncertainties for the time being. Keeping the enthusiasm on a high level Siemens internal and at our suppliers will be the future task since Siemens do not only want to create transparency but also actively reduce emission in our entire supply chain.

Filling in the questionnaires and discussing results with the involved suppliers is very time consuming. Siemens have to accept that it is not possible to involve the entire supplier base into the program. Selecting and focusing on suppliers with significant footprint is a challenge. Further stage of development is to involve not only first but also second to n-tier within specific supply chains.

CONCLUSIONS

Energy efficiency has always been of great significance for Siemens. With the Energy Health Check in our own production facilities potentials up, to 20% were identified. With the launch of the Energy Efficiency Program for suppliers in 2011 we aim to promote an approach in which the entire supply chain is based on well-planned, economical management of resources.

The program enables selected strategic suppliers to determine the energy and economical efficiency of their production and thus find potential for improvements. A free, -web-based tool is available where several questionnaires are implemented in order to evaluate the environmental and energy efficiency at a suppliers' location. There are two different levels available for the sustainability approach: Level 3 for production facilities covering Energy Management, Technical Energy Equipment, and Environmental Management and Level 4 mainly dedicated for non-producing facilities covering pure environmental aspects. Both levels determine the GHG emissions for a selected site. The result of level 3 is a 1-5 Star evaluation and a top measurement report with recommendations to improve energy and environmental efficiency. Level 4 gives a ranking of 1-10 Eco-Care points and covers basically environmental aspects. The methodology is patented by Siemens. Based on the evaluation, a statement of average possible optimization potential (up to 20%) is given. EEP4S creates transparency and tends to arouse and increase awareness for resource efficiency at our suppliers and along with that within the supply chain. Currently, more than 1300 suppliers are using the tool. The self-assessment is intended to be carried out every two years and the results will be monitored as part of the Siemens supplier management system.

The good feedback and valuable comments we have got via a conducted customer satisfaction survey encourage us to keep at the topic.

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