

## STUDY ON SMES INTEREST IN ENERGY EFFICIENCY IN GERMANY

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### Abstract

The aim of this study was to confirm the hypothesis that the exemption from the legal obligation leads companies to deal with the issue of energy efficiency. The study identified economic sectors with a significant interest in energy efficiency and their regional affiliation in an upstream literature review. In a further step companies from these economic sectors were questioned by telephone. In total, 2,000 companies were called by phone and 1,433 were reached. Of these companies, 178 took part in the survey. Based on our findings, we found that the hypothesis was at least partially confirmed.

### Keywords

Energy efficiency, Energy audit, SMEs, Public authorities

### JEL Classification

K23, K32, L88, L97, L98, P18, Q01, Q04, Q48

### Introduction

In recent years, several legislative acts have been adopted at the European level, with measures and arrangements for increasing energy efficiency. The Energy Efficiency Directive (EED) was adopted in 2012 as an essential part of the European Union energy policy (European Parliament and Council, 2012).

The German act on Energy Services and Further Energy Efficiency Measures (EDL-G) was adapted in 2015 as part of the implementation of EED (Bundestag, 2015). The EDL-G obliges many German companies to conduct an energy audit in accordance with DIN EN 16247-1. All non-SMEs are affected by this legal obligation (Bundesministerium für Wirtschaft und Ausfuhrkontrolle BAFA, 2019). These companies can be divided into two main groups. Enterprises that use the size-dependent values (Group 1) in Table 1 are considered non-SMEs.

**Table no. 1 Non-SME criteria**

employees	turnover	balance sheet total
≥ 250 or	≥ 50 Mio. Euro or	≥ 43 Mio. Euro

In addition, companies (Group 2) are considered non-SME even if at least 25% of their capital or voting rights are owned, directly or indirectly, by one or more public bodies or bodies governed by public law and controlled individually or jointly by them.

Previous studies have shown that energy consulting is an important tool to reduce information deficits and to identify potential savings and measures to improve the company's energy efficiency. However, these studies have also shown that regulatory interventions reduce the motivation of companies (Group 1) to invest in energy efficiency measures and that public sector enterprises (Group 2) do not fulfill their intended role model function. Most companies apparently lack the incentive to invest in energy efficiency measures from an angle other than profitability. It is obviously not a competitive advantage or an advantage for the majority of companies to improve the carbon footprint and adopt sustainable production techniques. (Kurth *et al.*, 2018; Kurth, Budz and Verjel, 2017).

On the other hand, there are companies that are classified as SMEs. Those enterprises (SMEs) play a key role in the European economy. They are an important source of entrepreneurial skills, innovation and employment. There are around 23 million SMEs in the 28-member states of the enlarged European Union, representing approximately 75 million jobs and 99% of the company's stock (European Commission, 2015; European Commission, 2006).

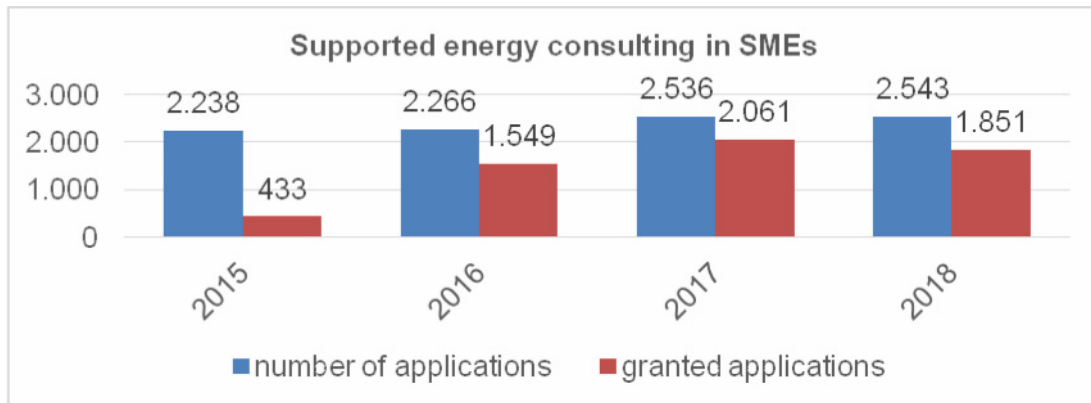
In order to significantly reduce the energy and climate policy goals of the Federal Republic of Germany, in particular the primary energy consumption and the emission of greenhouse gases, increasing the energy efficiency in small and medium-sized enterprises can make an important contribution (Bundesministerium für Wirtschaft und Energie BMWi, 2017). However, these SMEs are exempted from the legal obligation and do not have to subject themselves to any regulatory consideration of their energy efficiency (Bundestag, 2015).

With this study, the author wants to confirm the self-constructed hypothesis that the exemption from the statutory obligation to conduct energy audits has the effect that organizations are dealing with the issue of energy efficiency. The author believes that companies are more likely to be voluntarily motivated to be more energy-efficient, and that the energy analysis of specific business areas is more important than the demand for a holistic study. The hypothetical effect is empirically demonstrated by this study and thus confirms the hypothesis formulated above. In this way, the author wants to provide important insights for the entire research field of energy policy in order to be able to make better legal decisions in the future.

### **Literature Review**

Since 2015, the Federal Ministry for Economic Affairs and Energy (BMWi) has been promoting voluntary energy advice in SMEs in order to identify potential energy savings in companies, to increase the number of energy efficiency measures implemented and to achieve additional energy savings (Bundesministerium für Wirtschaft und Energie BMWi, 2017). The competent licensing authority publishes annual statistics. For this study, a systematic data analysis was carried out between July and December 2018 based on online data sources of the annual statistics from 2015 to 2018 of the Federal Office of Economics and Export Control (BAFA, 2018; BAFA, 2017; BAFA, 2016; BAFA, 2015)

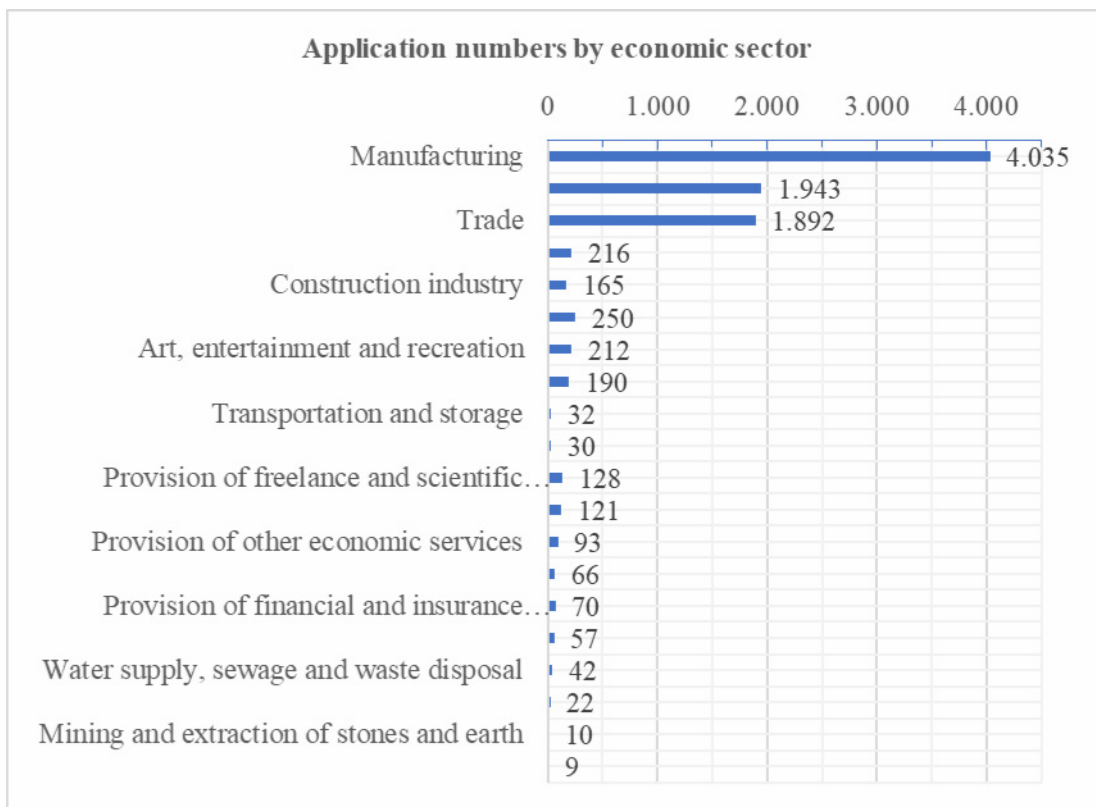
The aim of this literature research was to identify economic sectors that show an increased interest in energy efficiency. In addition, regions in the Federal Republic of Germany were identified where most of the supported energy consultations were conducted. Figure 1 shows the number of applications and the number of granted applications per calendar year. In the last four years, 9,583 applications have been submitted. Of these, 5,894 were approved. This corresponds to a rate of 61.50%.



**Fig. no. 1 Number of applications an granted applications for subsidized energy consulting in SMEs**

Source: BAFA. Jahresstatistik 2018, BAFA. Jahresstatistik 2017, BAFA. Jahresstatistik 2016 and BAFA. Jahresstatistik 2015

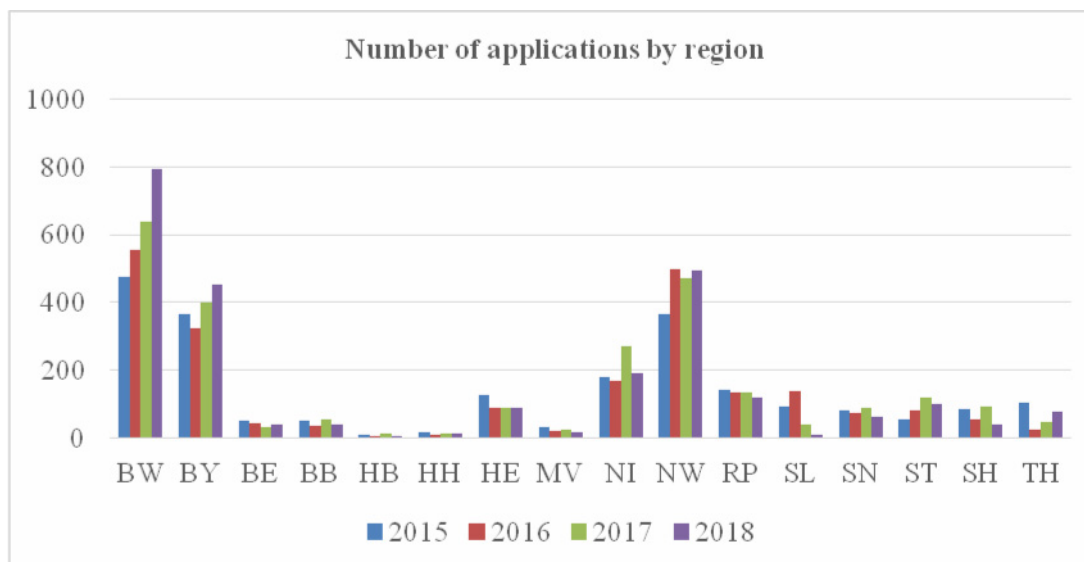
Figure 2 shows the results of the data analysis to identify the relevant economic sectors. A significant sector of the economy is the manufacturing sector with more than 40% of all financing applications. As a further significant economic environment, the hospitality and the trade were identified at 20% each.



**Fig. no. 2 Application numbers by economic sector**

Source: BAFA. Jahresstatistik 2018, BAFA. Jahresstatistik 2017, BAFA. Jahresstatistik 2016 and BAFA. Jahresstatistik 2015)

Figure 3 shows the results of the data analysis to identify the relevant regions. The federal states Baden-Wuerttemberg (BW), Bavaria (BY) and North Rhine-Westphalia (NW) were identified as the regions with the highest interest in energy consulting.



**Fig. no. 3 Number of applications by region**

Source: BAFA. Jahresstatistik 2018, BAFA. Jahresstatistik 2017, BAFA. Jahresstatistik 2016 and BAFA. Jahresstatistik 2015)

### Methodology of Research

First, a literature search (Method 1) was carried out to identify interested economic sectors and their regional affiliation. In a next step, companies from the identified economic sectors (method 2) were interviewed in a phone study (with expected yes or no answers).

### Survey results and discussion

To conduct the study, companies from the identified federal states (Baden-Württemberg, Bavaria and North Rhine-Westphalia) and the relevant economic sectors (manufacturing, hotels and trade) were interviewed. A total of 2,000 companies were called by phone and reached 1,433. Of these companies, 178 (8.9%) participated in the survey. It is not possible to draw any conclusions about the surveyed economic sectors and federal states, since the data records are anonymous. In the telephone interviews the following main questions were discussed:

Question 1: Have you already dealt with the issue of energy efficiency?

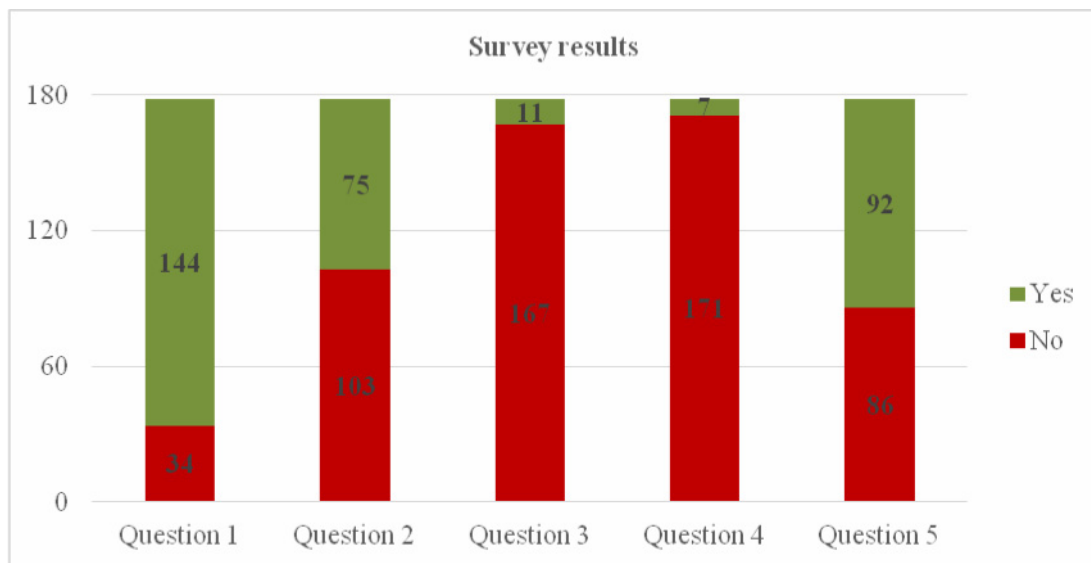
Question 2: Did you have an energy audit?

Question 3: Did you know that energy audits are being promoted for SMEs?

Question 4: Did you use the funding program?

Question 5: Do you intend to carry out an energy assessment of your company in the future?

The results of the telephone survey are shown in Figure 4. The research results for question 1 show that the majority (144 SMEs, 81%) of the companies surveyed already dealt with energy efficiency issues. However, only 75 out of 144 companies (question 2) did an energy audit.



**Fig. no. 4 Results of the survey**

Source: authors

Question 3 shows that only a small proportion (11 SMEs, 6%) of the companies surveyed knew about the financing program. The results for question 4 show that only 7 out of 75 companies that have carried out an energy analysis of their company have used the support program.

Question 5 shows that more than 50% plan to do an energy analysis. The 92 SMEs, together with the 75 companies that have already carried out an energy audit, constitute 93.82% of all participants.

### Conclusions

Contrary to previous research results, the current study shows that companies are very much concerned with the issue of energy efficiency on a voluntary basis.

An interest is clearly visible when the economic sectors are energy-intensive, and several energy-using technologies are used. This is characteristic of the manufacturing, hospitality and trade sectors.

Based on these findings, the identified states can be confirmed. At least for the regions of Bavaria and North Rhine-Westphalia, the manufacturing industry is decisive and typical.

The hypothesis that an exemption from the statutory obligation to carry out energy audits can lead organizations to address energy efficiency issues can thus be at least partially confirmed.

Another study should look at the evaluation criteria of SMEs for the implementation of energy optimization measures and correlate them with those of non-SMEs.

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