



Implementation of ISO 14001 Standard in the European Union Countries

Marcin Olkiewicz^{1}, Radosław Wolniak², Bożena Skotnicka-Zasadzień²*

¹Koszalin University of Technology, Poland

²Silesian University of Technology, Zabrze, Poland

**corresponding author's e-mail: marcin.olkiewicz@tu.koszalin.pl*

1. Introduction

The turn of the 20th and 21st has been an increased pressure from both internal and external stakeholders to implement quality management systems that pose a challenge and are one of organization's predominant activities. Quality has become the basis of reflection on the development of quality management systems improvement methods for contemporary business use. Attention for quality matters by the use of knowledge, skills and competences of the employees, began to form a unified whole, i.e. a quality management mechanism that enables, inter alia, appropriate supervision, planning, improvement, documentation, modification, etc. This means a holistic change in the organization's management directed towards increasing its value by undertaking the following measures:

- production (technical and technological change, logistics, etc.),
- human resources (improvement of qualifications through training, shaping the appropriate structure of employment, etc.),
- leadership – management (integration of knowledge with experience, strategic initiatives, more transparent and effective motivation, etc.),
- computerization (proper means of communication, implementation of ICT-based solutions, etc.),
- environmental protection (formulation of pro-ecological policy as part of sustainable development, etc.).

The quality management system (QMS) defined as a tool of interrelate do interacting elements for establishing policy (Kanglong & Wei 2019; Paulrau & Jong 2011) and objectives, as well as a method to achieve these objectives (Peszko 2002), is used to manage and supervise an organization in relation to

quality (Vidovic 2019). This means that organizations, through systemic measures, should constantly implement a specified quality strategy (Krawiec 2011; Searcy i in. 2012, Pirju 2019) to achieve significant long term development. It should be remembered, however, that the application of management system standards may be: obligatory (required and used in accordance with the specifics – nature of an activity or legal requirements) or optional (used voluntarily to obtain advantages (Urbaniak 2006), i.e. to increase competitiveness, improve the functioning of an organization, development, minimization of costs, etc.) (Myszewski 2009; Psomas et al. 2011; Bober et al. 2017).

It is worth pointing out that the use of management systems, within the framework of responsible management that efficiently uses quality instruments, provides organizations with the ability to develop and compete on both domestic and international markets, as well as to facilitate tasks and achieve quality objectives (Henrykowski 2008; Chiarini 2013; Pacana et al. 2017; Olkiewicz & Wolniak 2018; Andrei et al. 2019).

In the field of environmental protection, the environmental management system in accordance with the PN-EN ISO 14001: 2015-9 standard is a part of organisation's management system used to implement environmental policy and manage its environmental aspects (PN-EN 14001). This system identifies potential environmental threats that relate to its activity and the courses of action in the event of such threats were to occur. (Maletic i in. 2015; Pacana & Ulewicz 2017).

In other words: a system that operates in the framework of the system management model is a tool for the creation, maintenance and improvement of the quality of work, which indicates the directions for the improvement of organization's activities that are in line with the company's policy (Qi et al. 2013; Malindžák et al. 2017; Olkiewicz 2018). It is worth underlining that it is also a tool to support and activate top management to act and create the future. The main objectives of the environmental management system PN-EN ISO 14001: 2015-9 include:

- a proper environmental policy of an entity, adequate to the objectives of the organization's development strategy,
- a full identification of ecological issues and problems that are important for the company, while taking into account previous and planned environmental impacts,
- defining legal and normative requirements,
- setting priorities and environmental aims and objectives,
- implementation of programmes for the execution of tasks and analysis of their effects,
- proper operational control of processes affecting the state of the environment and, if necessary, making appropriate adjustments to an on-going basis,
- flexible response to signals and changes in the environment.

The system in accordance with the ISO 14001 standard is, therefore, designed to provide an organization with elements of effective environmental management, consisting in the organization and unification of activities for the purpose of environmental protection (Vires et al. 2012; Searcy et al. 2012) whilst achieving organization's objectives based on processes of continuous improvement in each element of the entity's activity. The use of this management system (Gebczyńska & Wolniak 2018) brings organizations closer to environmental globalization, i.e. entities that manage processes in the area of environmental protection in the framework of their activities (Pacana 2017). The main areas of activities of environmental globalization include:

- realism (real impact on production processes, the use of innovativeness, minimization of the greenhouse effect, etc.),
- correlation (interdependence and cooperation between entities minimizing geographical, legal, cultural and religious barriers),
- coordination (development of proper pro-ecological policy - its financing, monitoring and execution mechanisms),
- awareness (shaping of pro-ecological attitudes as an important element of a modern socio-economic life, quality and development of life),
- credibility (material, political, cultural, technological, legal, etc. responsibility for the creation, dissemination and promotion of pro-environmental behavior and activities).

Proper ecological management contributes to the incensement in the profitability of an organization through, among others: the effectiveness of the use of natural resources (reduction of the negative effects humans have on the environment whilst strengthening the economy's resistance to environmental pressure) (Szpor & Śniegocki 2012; Koukaou et al. 2013), creation of ecological products (Carley & Sapens 2000), modernization or creation of new technological processes (Woźniak et al. 2010), implementation of quality standards (Wolniak & Sędek 2009; Olkiewicz et al. 2015). Furthermore, this allows to conduct appropriate marketing policy (Oslo Manual 2005) as an organization that promotes pro-ecological behavior. Such a strategic direction in the era of "healthy lifestyle" will allow for a sustainable development of the organization and to gain competitive advantage in a particular economic sector and the area of business activity.

2. Methodology

This publication addresses the analysis of the implementation of the ISO 14001 standard in the European Union countries. Data on the number of implemented ISO 14001 certificates in individual countries were used to carry out this research (for the purpose of conducting research, only these countries where the

number of certificates exceeded 100 were chosen - Malta and Luxemburg where, therefore, left out). The number of ISO 14001 certificates for each individual country were adopted as ISO Survey 2018. Appropriate data was collected in Table 1.

Table 1. ISO 14001 certificates, population and the GDP per capita in the EU countries

| No | Country | ISO 14001 | Population [mln] | PKB per capita [\$] |
|----|----------------|-----------|------------------|---------------------|
| 1 | Austria | 1079 | 8.85 | 54085 |
| 2 | Belgium | 1012 | 11.46 | 49705 |
| 3 | Bulgaria | 1946 | 7.00 | 24577 |
| 4 | Czech Republic | 4266 | 10.64 | 39337 |
| 5 | Croatia | 1024 | 4.07 | 27664 |
| 6 | Cyprus | 216 | 0.87 | 41572 |
| 7 | Denmark | 1012 | 5.81 | 54564 |
| 8 | Estonia | 520 | 1.32 | 35346 |
| 9 | Finland | 1467 | 5.51 | 48221 |
| 10 | France | 6084 | 67.03 | 47113 |
| 11 | Germany | 8028 | 83.02 | 54984 |
| 12 | Greece | 1415 | 10.72 | 30522 |
| 13 | Hungary | 2391 | 9.80 | 33409 |
| 14 | Ireland | 957 | 4.90 | 81686 |
| 15 | Italy | 15118 | 60.36 | 40737 |
| 16 | Netherlands | 2181 | 17.28 | 59105 |
| 17 | Latvia | 336 | 1.92 | 31215 |
| 18 | Lithuania | 914 | 2.80 | 37162 |
| 19 | Poland | 2921 | 37.97 | 33409 |
| 20 | Portugal | 1382 | 10.28 | 33409 |
| 21 | Romania | 4553 | 19.40 | 27753 |
| 22 | Slovakia | 1687 | 5.45 | 37268 |
| 23 | Slovenia | 432 | 2.08 | 38841 |
| 24 | Spain | 12198 | 46.93 | 42120 |
| 25 | Sweden | 3598 | 10.23 | 54474 |
| 26 | United Kingdom | 11201 | 66.647 | 47042 |

Source: own work on basis of data from: ISO Survey 2018

The analysis also uses author's own indicator for the widespread of environmental certificates expressed in the number of certificates per million inhabitants for each country. Data on the population of the European Union countries was used (Eurostat 2019) for its calculation (Table 1). The indicator for the saturation with the ISO 14001 environmental certificates in the EU countries is shown in Table 2. Additionally, the GDP per capita was used in the analysis for each country. The GDP was calculated in accordance with the purchasing power parity method and is presented in Table 2. The GDP indicator was based on the Eurostat data for the year 2019.

Table 2. The saturation with the ISO 14001 environmental certificates in the EU countries

| No | Country | ISO 14001 certificates per one million population |
|----|----------------|---|
| 1 | Austria | 121.92 |
| 2 | Belgium | 88.31 |
| 3 | Bulgaria | 278.00 |
| 4 | Czech Republic | 400.94 |
| 5 | Croatia | 251.60 |
| 6 | Cyprus | 248.28 |
| 7 | Denmark | 174.18 |
| 8 | Estonia | 393.94 |
| 9 | Finland | 266.24 |
| 10 | France | 90.77 |
| 11 | Germany | 96.70 |
| 12 | Greece | 132.00 |
| 13 | Hungary | 243.98 |
| 14 | Ireland | 195.31 |
| 15 | Italy | 250.46 |
| 16 | Netherlands | 126.22 |
| 17 | Latvia | 175.00 |
| 18 | Lithuania | 326.43 |
| 19 | Poland | 76.93 |
| 20 | Portugal | 134.44 |
| 21 | Romania | 234.69 |
| 22 | Slovakia | 309.54 |

Table 2. cont.

| No | Country | ISO 14001 certificates per one million population |
|----|----------------|---|
| 23 | Slovenia | 207.69 |
| 24 | Spain | 259.92 |
| 25 | Sweden | 351.71 |
| 26 | United Kingdom | 168.06 |

Source: authors own work

3. Research results and discussion

Taking into account absolute numbers, the largest quantity of organizations having an environmental management system in accordance with the requirements of ISO 14001 occurs in the largest European Union countries, in particular: Italy 15118 certificates, Spain 12198 certificates, United Kingdom 11201 certificates, Germany 8028 certificates, France 6084 certificates. Due to the fact that European Union countries vary in size, there is no point in comparing the absolute numbers of certificates because, understandably, the larger the country the more certificates implemented. Therefore, it was considered that in order to eliminate the impact that the size of the country has on the obtained results, the number of ISO 10014 certificates per one million inhabitants should be used instead. This indicator is called “country saturation with certificates”.

Figure 1 presents a summary of saturation with the ISO 14001 environmental certificates in the European Union countries. The analysis of the data shows that the highest level of saturation with certificates is in the Czech Republic (400,94), Estonia (393,94) Sweden (351,71), Lithuania (326,43) and Slovakia (309,54). The data indicates that ISO 14001 certificates are implemented to a greater extent in countries that joined the European Union after the year 2000.

These are the countries with lower levels of economic development compared to the countries of the “old” Union and the implementation of various types of management systems that have established reputation on international markets is a way to improve the functioning of economy and provide opportunity to enter larger markets. This becomes particularly evident when one takes into account the developed countries, e.g. Germany (96,7) or France (90,77), where levels of saturation with the ISO 14001 certificates are the lowest among the European Union countries.

Poland is lagging behind in the implementation of environmental management standards. With the level of saturation with certificates at 76,93, Poland takes the lowest place among the surveyed European Union countries. This is particularly a poor result in comparison with the neighboring countries that joined

the European Union in a similar period of time. These countries have a significantly higher level of saturation, often by several times, with the ISO 14011 certificates. On this basis it can be concluded that there is limited interest with the environmental issues in Poland.

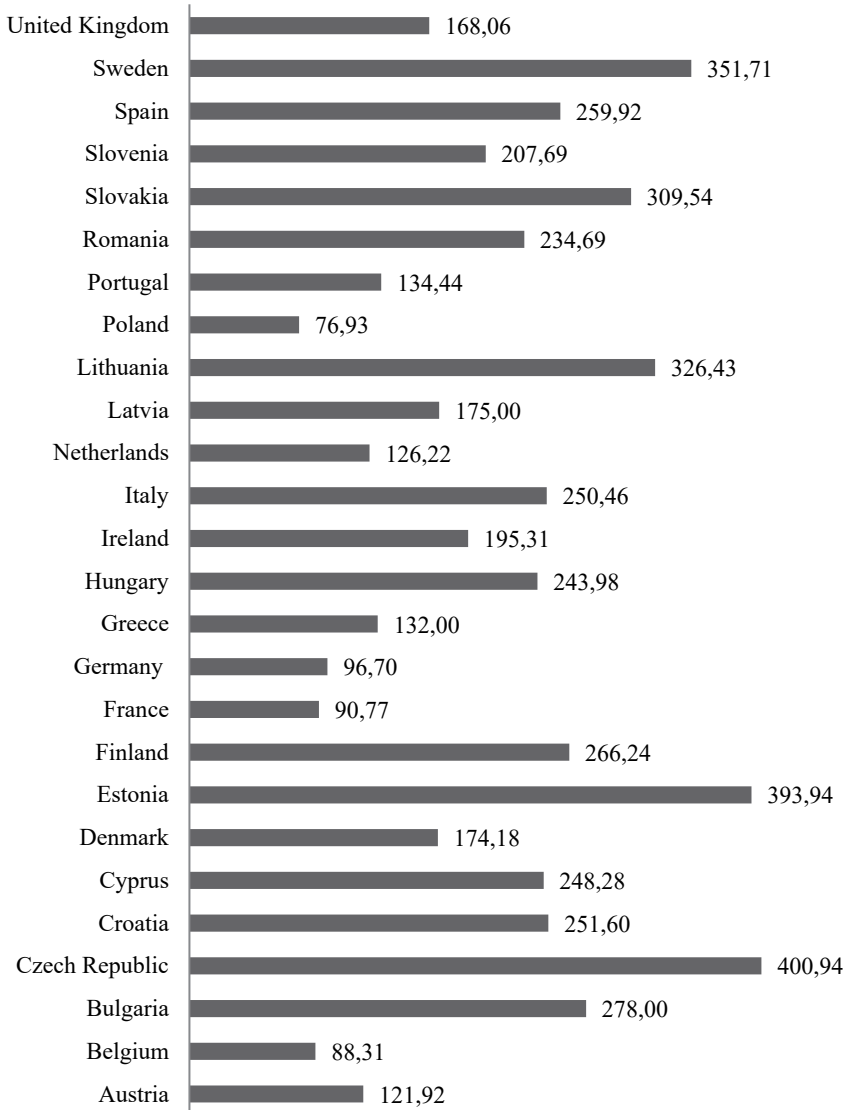


Fig. 1. ISO 14001 certificates per one million inhabitants in the EU countries

Figure 2 shows the analysis of the spread rate between the studied countries on the basis of two variables – the saturation with ISO 14001 certificates and the GDP per capita (numbers in the figure indicate the numbering of countries in accordance to Table 1 and Table 2).

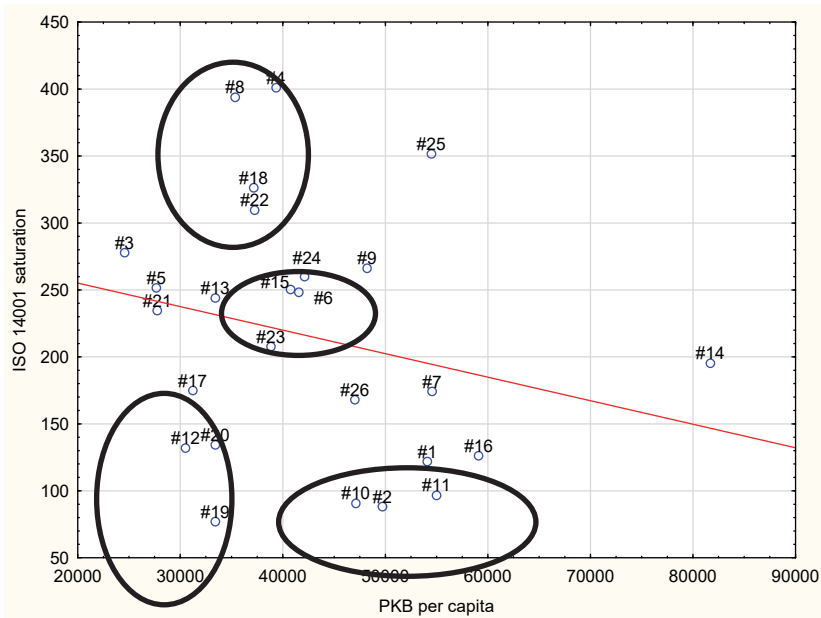


Fig. 2. The saturation level with the ISO 14001 and the GDP per capita

The statistical analysis of data at the $\alpha = 0.05$ significance level has shown no existence of positive correlation between the variables. Nevertheless, it can be seen from the figure that the average indicator for the widespread of certificates is falling together with the prosperity of a country. This confirms the previous statement that in many cases environmental standards are a means to cope with the economic backwardness and to obtain a better marketing position for a given country, particularly in the international market. Other analyses indicate that a similar situation occurs with ISO 9001 quality management standards.

Several coherent country groups can be distinguished in Figure 2:

- Countries with a high level of saturation with certificates and an average GDP level per capita. These may include in particular: the Czech Republic, Estonia, Lithuania and Slovakia. These countries located in Central and Eastern Europe joined the EU in 2004 and, as was mentioned previously, are all strongly involved in the implementation of ISO 14001 to overcome the economic

backwardness and not to lag behind the leading European Union countries. Simultaneously, these are the countries where the importance of environmental issues is noticed because, as the example of Poland shows, the geographical location and economic conditions or even the year of accession to the European Union, does not determine the attitude towards the implementation of environmental management systems. Poland, despite the fact that in all mentioned areas is analogous to the discussed group of countries, is still situated on the completely opposite side of the chart – placed the lowest among other EU countries.

- The second group consists of countries with an average level of economic development and moderately higher level of saturation with ISO 14001 certificates than would result from their prosperity. Four countries can be included in this group: Cyprus, Finland, Italy and Spain. Outside Finland, these are all Mediterranean countries. In the case of Spain and Italy, the frequent implementation of environmental certificates is most likely due to reasons similar to the frequent implementation of ISO 9001 quality management certificates in these countries. It serves as a method to reduce corruption, bureaucracy and problems concerning the organization of work in these countries.
- The third group enlists countries with a low GDP level and a minimum involvement in the implementation of ISO 14001 environmental certificates. This group includes: Lithuania, Greece, Portugal and Poland. In these countries there is no importance attached to environmental issues in business.
- The fourth group consists of relatively prosperous countries (medium and high level of GDP per capita) that are implementing relatively few ISO 14001 certificates. This group includes: Austria, Belgium, France, Germany and the Netherlands. Organizations in these countries have a firm position on the international market, so even though they do not have appropriate standards, they find clients. As a consequence, there is no market pressure in these countries to implement environmental standards.

Distinguished groups are coherent and are connected with ISO 14001 saturation and PKB per capita. Especially interesting is the second group, because on this example, we see the important role of management systems certification to counteract the economic backwardness to achieve competitiveness on the global market.

4. Conclusions

The analysis presented in this publication demonstrated that there is a negative relationship between the GDP per capita and the saturation with ISO

14001 certificates in the European Union countries. It has been noted that ISO 14001 certificates are particularly often implemented in countries that joined the EU in 2004: the Czech Republic, Estonia, Lithuania and Slovakia. Similar to the ISO 9001 quality management systems, ISO 14001 environmental certification occurs in countries with medium economic backwardness in comparison to highly developed countries. Organizations in these countries want to enter international markets and perceive certificates as a convenient way to prove that they operate in accordance with the modern environmental policy. Market pressure is a very important factor in the implementation of ISO 14001 environmental standards by organizations. They implement these standards when it enables them to expand into new, in particular international markets.

Apart from objective facts, the attitude of citizens of given countries towards the environmental issues also plays a very important role. This can be seen in the case of Poland, which has the lowest saturation level with ISO 14001 certificates in the European Union, despite having similar economic conditions and market pressure. This can be resolved by carrying out activities that increase awareness towards the importance of environmental issues in a given country.

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Abstract

The uptake of various types of norms on management around the world resulted in the creation of a range of certificates that have been accepted by organizations and are improving their marketing position on the international market. In the area of environmental management, the ISO 14001 norm is the type of certificate that is widely used. This norm is implemented by many industrial and, ever more often, service organizations around the world.

This publication presents an analysis of the state of implementation of the ISO 14001 standard in European Union countries. To carry out the analysis, saturation of ISO 14001 indicator was introduced, which is discussed in detail in the later part of the publication. The article aims to examine saturation with the ISO 14001 certificates of European Union countries and determine whether there exists a relation between the saturation of ISO 14001 certificates and the wealth of individual countries measured by GDP per capita.

Keywords:

environmental management, quality, ISO 14001, certificate

Implementacja normy ISO 14001 w krajach Unii Europejskich

Streszczenie

Powszechne rozpowszechnienie różnego rodzaju norm dotyczących zarządzania na świecie powoduje, że powstało wiele tego rodzaju certyfikatów, znajdujących uznanie organizacji i poprawiających ich pozycje marketingową na rynku międzynarodowym. W obszarze zarządzania środowiskowego tego rodzaju certyfikatem, powszechnie stosowanym na świecie, jest norma ISO 14001. Jest ona stosowana na całym świecie przez wiele organizacji zarówno przemysłowych jak i coraz częściej usługowych.

W niniejszej publikacji przedstawiono analizę stanu implementacji normy ISO 14001 w krajach Unii Europejskiej. Aby wykonać tego rodzaju analizę posłużono się wprowadzonym wskaźnikiem nasycenia certyfikatami ISO 14001, który został szczegółowo omówiony w dalszej części publikacji. Celem artykułu jest zbadanie nasycenia certyfikatami ISO 14001 krajów Unii Europejskiej i określenie czy istnieje związek między nasyceniem certyfikatami ISO 14001 a zamożnością poszczególnych krajów mierzonym PKB per capita.

Słowa kluczowe:

zarządzanie środowiskowe, jakość, ISO 14001, certyfikat