

ENVIRONMENTAL MANAGEMENT SYSTEMS – EUROPEAN PERSPECTIVE

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ABSTRACT

The following article is devoted to determine what the main tendencies are concerning the Environmental Management Systems' certification in the accordance with ISO 14001 and EMAS' registrations in the years 1999–2013 from a different countries' perspective. Giving examples of representative quantitative data, the author presents dynamics of the growth of environmental management systems and also absolute positional qualifications (describing numbers of certificates and registrations), as well as relative qualifications (presenting numbers of certificates and registrations per million residents) in various European countries. The quantitative analyses that have been conducted show a general increasing tendency regarding the number of certificates and registrations. Looking from a perspective of different European countries, Italy and Spain have gained highest evaluation concerning the certification of environmental management systems according ISO 14001 and registration in EMAS.

KEYWORDS: *Environmental Management Systems, ISO 14001, EMAS.*

JEL CODES: M16; Q01; R11.

Introduction

The natural environment is present in theory and practice of the current management for many years. At first informal attempts to include environmental factors in management with time has led to the formation of formal standards in this area. At present two system standards are most often applied: Environmental Management Systems according to ISO 14001 and EMAS - Eco-Management and Audit Scheme. This text is devoted to these particular systems. In this respect a main research question was formulated:

Research Question. How does the state of the certification of Environmental Management Systems according to ISO 14001 and the registration in EMAS look like over the past few years in various European countries?

Trying to find the reply to the main research question the appropriate dataset should be determined. There were used scientific methods: document analysis, quantitative analysis. In case of the state of organizations registered in EMAS data is coming from the formal EMAS register (EMAS register 2015; EMAS overview 2014). For analyses data was taken in relation to the sites rather than organization. Under one registration number there is a substantial amount of sites which underwent the EMAS verification. For example in case of the UPM-Kymmene Corporation registered under the number FI-000058, 20 different locations are seen in various countries, the other record-breaking example is Eurobank Ergasias S.A. with 245 sites, all of them placed in Greece. The reason of choosing the sites option instead of organizations registered in EMAS is that in case of data concerning certified Environmental Management Systems according to ISO 14001 a number

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of certificates referring to sites was also taken into account. Otherwise data would be incomparable. Data applying to certificates of the Environmental Management System according to ISO 14001 are International Organization for Standardization (ISO survey, 2013) official figures. However it should be emphasized that data is not about all given certificates but only the ones granted by accredited certifying units a member of International Accreditation Forum (IAF). Analysing data it should remember about their restrictions, most important are as follows:

- Data comes from two different sources, the EMAS register and ISO therefore it isn't possible to establish their full cohesion.
- Data about EMAS up to the year 2004/2005 wasn't collected on the account of two options: organization and sites, so they can include inaccuracies.
- Data about ISO 14001 come only from these certificate authorities, from which experts managed to acquire them, this is data only and exclusively from accredited institutions members of IAF.

In spite of this type of restrictions and differences in these two types of data, they will allow for the presentation of main tendencies if it is about ISO 14001 and EMAS as well as they will enable the general comparison between them. For analyses purposes – data from years 1999–2013 was taken into consideration. Information about EMAS are accessible from 1997 until 2014, data about ISO 14001 from 1999–2013 and this scope of dates is narrower and constituted the time-frame of present analyses.

1. Foundations of the environmental management

Environmental management systems have a conception of the sustainable development as one of the foundations, which for the first time was defined in the so-called Brundtland Report (1991) and assumed such an attempt to the development so that meeting the needs and ambitions of the generation of our times inhabiting the Earth as well as next generations was possible (Jeżowski, 2007: 12; Möller, 2013: 69–74). The sustainable development is not concentrating fragmentarily on single aspects of the economy but includes technological, social, environmental and economical aspects and the exploitation of resources of different kind in the harmonized way (Żemigała, 2012: 117). Based on the assumption of expanding problems connected with balanced integration of both the world's natural environment and the world of the organization and management and the expanding pressure directed from different stakeholders (Delmas, Toffel, 2004: 209–222), attempts to take ecological factors into account in the management and to settle them in the organizational strategies started turning up (Christmann, 2000: 663). It is possible to search for beginnings of action of this type in Swiss and German enterprises, it is there where in the middle of the eighties the first in the world Society for the Environmental Management came into existence (Poskrobko, 2007: 255). The first formal standard was developed by British Standard Institute in 1992, the standard was called BS 7750: the Specification for Environmental Management Systems (Adamczyk, 2004: 47–49; Kłos, 2012: 252). The next turning point is a regulation of the European Parliament and Councils of Europe from 1993, that is EMAS (Eco - Management and Audit Scheme) (Kucińska-Landwójtowicz, 2013: 173–178). Virtually simultaneously the first version of ISO 14001 standards appeared, it was in 1996 and the standard was entitled Environmental Management Systems – Requirements with Guidance for Use (Bansal, Hunter, 2003: 289). These two basic standards until this day did not remain unchangeable but were verified and amended.

It is worthwhile mentioning the next foundation of the environmental management, so the standards of the environmental management were developed – based on the earlier existing standards concerning the quality management. Both BS 7750 and ISO 14001 had their quality counterparts: BS 5750 and ISO 9001. This evolution from the quality management to the environmental management is also visible in management practice, the enterprises most often start formalizing their approach towards the quality management and are implementing appropriate standards, and standards of the environmental management are usually a further step. In ISO 14001 standards there is a reference to the continuous improvement cycle (W. E. Deming's cycle): Plan – Do – Check – Act which allows to emphasize the Total Quality Management role in the

development of the systemic approach to the environmental management (Klassen, 1996: 1201 McLaughlin).

Still another foundation of environmental management systems is a general systems theory (Poskrobko, Poskrobko, 2012: 18), which the meaning was explained by Ludvig von Bertalanffy: «formulating principles being in force with reference to systems in general is its object, whatever is the essence of their constituent elements and relations occurring between them, i.e. forces up and running in them. Thus the general systems theory is a general knowledge about all-encompassingness which so far was regarded as the unclear, sketchy and in half metaphysical notion. In the developed form it would be a logical - mathematical discipline, in itself purely formal but being suitable for applying in different empirical sciences» (Bertalanffy, 1984: 68). On the basis of the theory of organization and management, the general systems theory allowed to formulate models of the organization as systems, at first H. J. Leavitt (Bielski, 2004: 43–44) consisting of four subsystems: people, tasks, structure and technology and then F. E. Kast and J. E. Rosenzweig (1972: 447–465), where the fifth subsystem of the management was added, which merged the four previous ones, in this model they were called the subsystem of aims and value, psychosocial, structure and technology. The main principles of the systems theory are applicable both in EMAS as well as in ISO 14001 (Morgan, 1997: 48):

- The organization as the open system which is in constant interaction with surroundings and from surroundings depends its functioning. In the counterpoint there is comprehending the organizations as closed systems, reacting only to programmed signals.
- The homeostasis, i.e. the ability of the organization to the self-regulation, to support the state of the stability.
- The negative entropy (typical for open systems) that is the tendency of supporting existence by taking the energy in order to overcome the tendency to the entropy (decline of the system, ageing and the drop – typical for closed systems).
- The diversity; the inside mechanisms of the organisation system must be so diverse and changeable like surroundings, must integrate with it.
- The equifinality, i.e. principle about the existence of the many means of achieving it aims, to the final state. In closed systems these relations are rigidly established, the result is planned, effects cannot be different from assumptions.
- The evolution, i.e. the development, going to more compound forms, more integrated with surroundings, the increase of the diversity which is missing in closed systems.

Both systems (ISO 14001 and EMAS) have a strategic dimension, they are concentrated on relations with surroundings, they are connected with the identification of environmental aspects and impacts, with the environmental planning (politics, environmental aims and tasks), and they allow to establish action frames of the organization in accordance with principles of the sustainable development (Darnall, Jolley, Handfield, 2008: 31). They don't have technical character but methodological (ISO 9001 are functioning by analogy [Heras-Saizarbitoria, Boiral, 2013: 49]), they are giving the way of how to establish, to implement and to maintain the specific environmental management system (Żemigala, 2013: 60–61) and the systemic approach is being regarded as the most effective if it concerns combining economic and ecological aspects (Florida, Davison, 2001: 64).

2. Environmental management systems: ISO 14001 and EMAS

ISO 14001 is an international (based on procedures (Delmas, 2002: 92) environmental management standard developed by International Organization for Standardization (ISO) which can be implemented in the organization of every type and from every geographical location. ISO 14001 is available both for small and medium enterprises as well as for large corporations and for public organisations such as hospitals, schools or offices. A model displayed on Fig. 1 is a main pivot of the Environmental Management System.

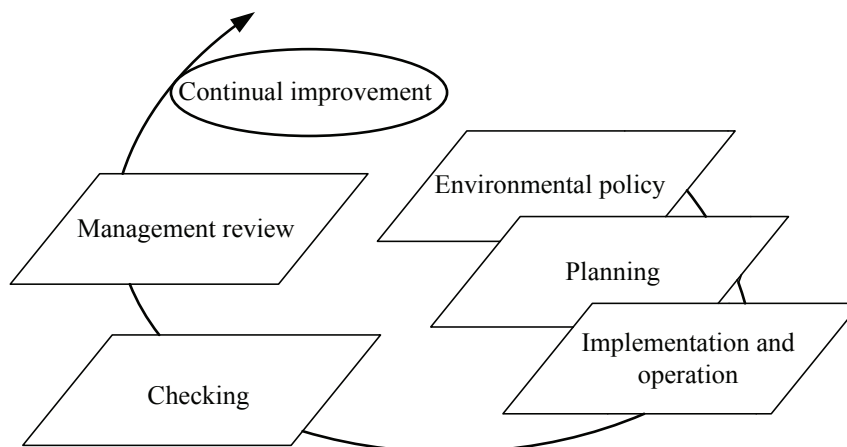


Figure 1. Model of the environmental management system according to ISO 14001

Source: (PN – EN ISO 14001 2005: 9)

However ISO 14001 is only one standard from the entire family of ISO standards of 14 000 series, although it is the most important standard because it is the only one intended for certification purposes, remaining standards are instrument, assisting standards, some of them still remain systemic standards and others concern e.g. environmental labelling or life cycle assessment, some of them were described in the table No. 1.

Table 1. List of more important standards of ISO 14000 series

Ordinal number	Standard number	Standard title
1	EN ISO 14001:2004	Environmental management systems – Requirements with guidance for use
2	EN ISO 14004:2010	Environmental management systems – General guidelines on principles, systems and support techniques
3	EN ISO 14006:2011	Environmental management systems – Guidelines for incorporating ecodesign
4	EN ISO 14015:2010	Environmental management – Environmental assessment of sites and organizations (EASO)
5	EN ISO 14020:2001	Environmental labels and declarations – General principles
6	EN ISO 14021:2001	Environmental labels and declarations – Self-declared environmental claims (Type II environmental labelling)
7	EN ISO 14024:200	Environmental labels and declarations – Type I environmental labelling – Principles and procedures
8	EN ISO 14025:2010	Environmental labels and declarations – Type III environmental declarations – Principles and procedures
9	EN ISO 14031:2013	Environmental management – Environmental performance evaluation – Guidelines
10	EN ISO 14040:2006	Environmental management – Life cycle assessment – Principles and framework
11	EN ISO 14044:2006	Environmental management – Life cycle assessment – Requirements and guidelines
12	EN ISO 14045:2012	Environmental management – Eco-efficiency assessment of product systems -- Principles, requirements and guidelines
13	EN ISO 14050:2010	Environmental management – Vocabulary
14	EN ISO 14051:2011	Environmental management – Material flow cost accounting – General framework
15	EN ISO 14063:2010	Environmental management – Environmental communication – Guidelines and examples

Source: own elaboration

If however it is about EMAS, it is a European system and so it has also such range (European Union countries), although similarly to ISO 14001, it can be applied in every type of the organization. However EMAS does not have a status of the standard, because it is a regulation of the European Parliament and Council. For users of the system the important difference can be that EMAS is a free of charge document possible to download from the system's official web site, however the ISO 14001 standard is payable and this price is considerable: 118 Swiss francs, which by the currency rate from 01.07.2015 amounts to about 113 Euros. Environmental Management System according to ISO 14001 is possible to certificate however in EMAS it is possible to register (Glachant, Schucht, Bültmann, Wätzold, 2002: 256), even though it seems as only a semantic difference it has significant meaning. The EMAS register is determining the fact that the system is centrally supervised, the EMS ISO 14001 certification is completely free from bureaucratic and administrative conditioning and operates with the principles of free market. EMAS has its own logo (cf. fig. 2) and the organizations registered in the system can use it for promotional purposes, in case of ISO there is lack of such instrument. EMAS is a system going a little bit further than ISO 14001 if it is about communication with surroundings, in case of ISO 14001 an environmental policy must be publicly available, EMAS in this regard requires a greater openness – it means the accessibility to the so-called environmental declaration, which is a much broader document than environmental policy alone. Environmental policies are preliminary system documents drawn up on the great level of the generality, volumetrically usually one-page at most, however in environmental declarations there is far more specific information (e.g. direct and indirect environmental aspects, environmental aims and tasks, environmental effects of organizational activity, main environmental efficiency indicators and others.), as for a volume, it is usually documents counting several dozen pages. An approach towards the law regulations is a next important difference between these two systems, which in case of ISO 14001 it is more liberal, however in EMAS it is more restrictive. These last two differentiating elements, i.e. the approach towards law regulations and public availability as well as differences as for the regional availability, are determining the infinitesimal number of implementations of the EMAS system towards ISO 14001 largely. It is important to add that while introducing the EMAS system the organization must implement the environmental management system in accordance with ISO 14001, though it must not be certified. So ISO 14001 is a reference system for EMAS (Boiral, 2007: 127). And so it seems that EMAS is a certain kind of cover on ISO 14001, a more demanding and regionally limited to European Union system, which so far failed to win with the competition.



Figure 2. EMAS logo

Source: EMAS Regulation 2009: 39

3. Adequate analyses of certified environmental management systems ISO 14001 and the EMAS registration

85 386 sites were registered in EMAS in the entire analysed fifteen-year-old period, which constitutes 9 % of the number of certified environmental management systems according to ISO 14001, which was 901 721. Yearly average of registration in EMAS was 5692 and certified EMS ISO 14001 60115. As for dynamics in the area of ISO 14001 except for 2011 in all years the tendency was increasing and averaged at 7990 certified EMS annually (it is 23 % considering the 100 % as the number of certificates in the previous year). In case of EMAS average annual growth is 575 registered sites, which in percentage gives 11 % (counting by analogy as in the case of ISO 14001). It is worthwhile emphasizing that three years were noted with the negative increase: 2002, 2003 and 2012. It turns out that there are much less registrations in EMAS than certified EMS ISO 14001, they are characterized also by weaker dynamics but the general trend in the entire period is increasing and no particularly drastic decreases of the trend were noted, nothing is also indicating for turning it around in the immediate future (specific information on this subject is in a table No. 2 and on the fig. No. 3).

If however it is about EMAS and ISO 14001 in individual European countries the situation is more diversified. The up-to-date available data was taken to this more detailed analysis, that is for 2013. Countries, in which most certificates were written down in the scope of ISO 14001 and the EMAS sites registration, are deserving the highest attention and assuming that it is the first 30 % from such absolute quantitative classification in case of ISO 14001 we should list: Italy, Great Britain, Spain, Romania, Germany, France, the Czech Republic, Sweden, Netherlands and Poland. If considering EMAS - these are: Italy, Spain, Austria, Germany, Denmark, Greece, Belgium and Poland (the detailed data is introduced in the table No. 3). However above all we should pay our attention to these countries which occupied the position (by analogy first 30 % of absolute classification) in both systems, in this case a very elite and small circle of 4 countries already remains: Italy, Spain, Germany and Poland, which was in both classifications on exactly established threshold (the detailed data is introduced on the fig. 4).

Table 2. Dynamics of growth of environmental management systems in period 1999–2013

Ordinal number	Year	EMAS			ISO 14001		
		Registered sites	Absolute growth	Relative growth	Certificates	Absolute growth	Relative growth
1	1999	2775	–	–	7253	–	–
2	2000	3576	801	29 %	10971	3718	51 %
3	2001	3912	336	9 %	17941	6970	64 %
4	2002	3797	-115	-3 %	23305	5364	30 %
5	2003	3498	-299	-8 %	30918	7613	33 %
6	2004	4093	595	17 %	39805	8887	29 %
7	2005	4628	535	13 %	47837	8032	20 %
8	2006	5223	595	13 %	55919	8082	17 %
9	2007	5914	691	13 %	65097	9178	16 %
10	2008	6743	829	14 %	78118	13021	20 %
11	2009	7528	785	12 %	89237	11119	14 %
12	2010	7794	266	4 %	103126	13889	16 %
13	2011	8112	318	4 %	101177	-1949	-2 %
14	2012	6967	-1145	-14 %	111910	10733	11 %
15	2013	10826	3859	55 %	119107	7197	6 %

Source: own elaboration based on the data from ISO and EMAS Register

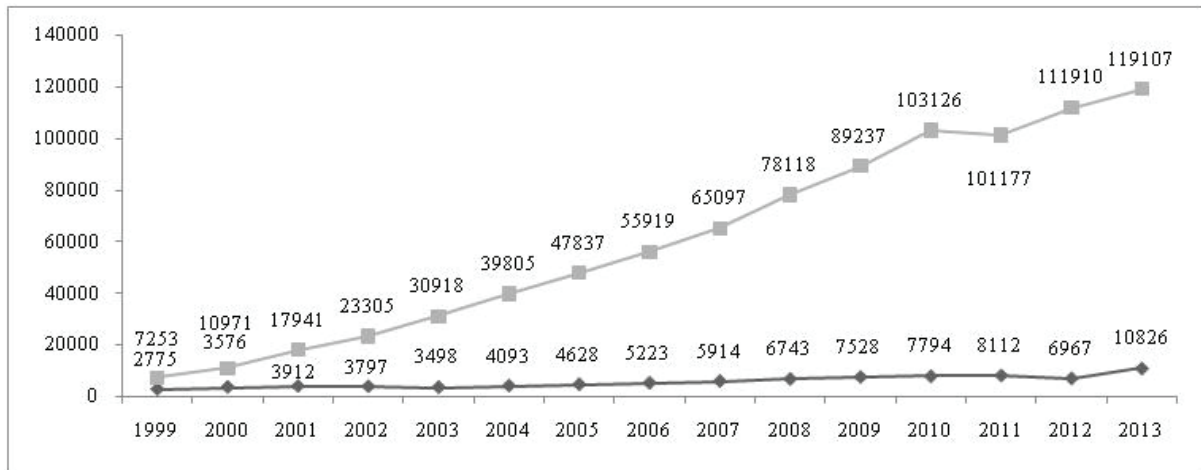


Figure 3. Tendencies of the site's registration in EMAS and certified EMS ISO 14001 in years 1999–2013

Source: own elaboration based on the data from ISO and EMAS Register

Table 3. Certified and registered environmental management systems ISO 14001 and EMAS in European countries in 2013 – absolute classification

Ordinal number	Country	EMAS		ISO 14001	
		Position	Registrations	Position	Certificates
1	Austria	3	933	17	1069
2	Belgium	7	180	16	1153
3	Bulgaria	20	3	14	1373
4	Croatia	23	0	20	828
5	Cyprus	13	35	28	57
6	Czech Republic	11	50	7	4792
7	Denmark	5	355	21	812
8	Estonia	12	48	25	440
9	Finland	15	22	13	1422
10	France	14	31	6	7940
11	Germany	4	434	5	7983
12	Greece	6	305	19	1025
13	Hungary	16	20	11	1955
14	Ireland	22	1	22	698
15	Italy	1	5856	1	24662
16	Latvia	23	0	26	296
17	Lithuania	17	18	23	649
18	Luxembourg	22	1	27	89
19	Malta	22	1	29	35
20	Netherlands	19	4	9	2419
21	Norway	18	8	18	1047
22	Poland	8	127	10	2220
23	Portugal	9	116	15	1326
24	Romania	20	3	4	8744
25	Slovakia	21	2	12	1445

Ordinal number	Country	EMAS		ISO 14001	
		Position	Registrations	Position	Certificates
26	Slovenia	23	0	24	468
27	Spain	2	1036	3	16051
28	Sweden	22	1	8	3690
29	United Kingdom	10	65	2	16879

Source: own elaboration based on the data from ISO and EMAS Register

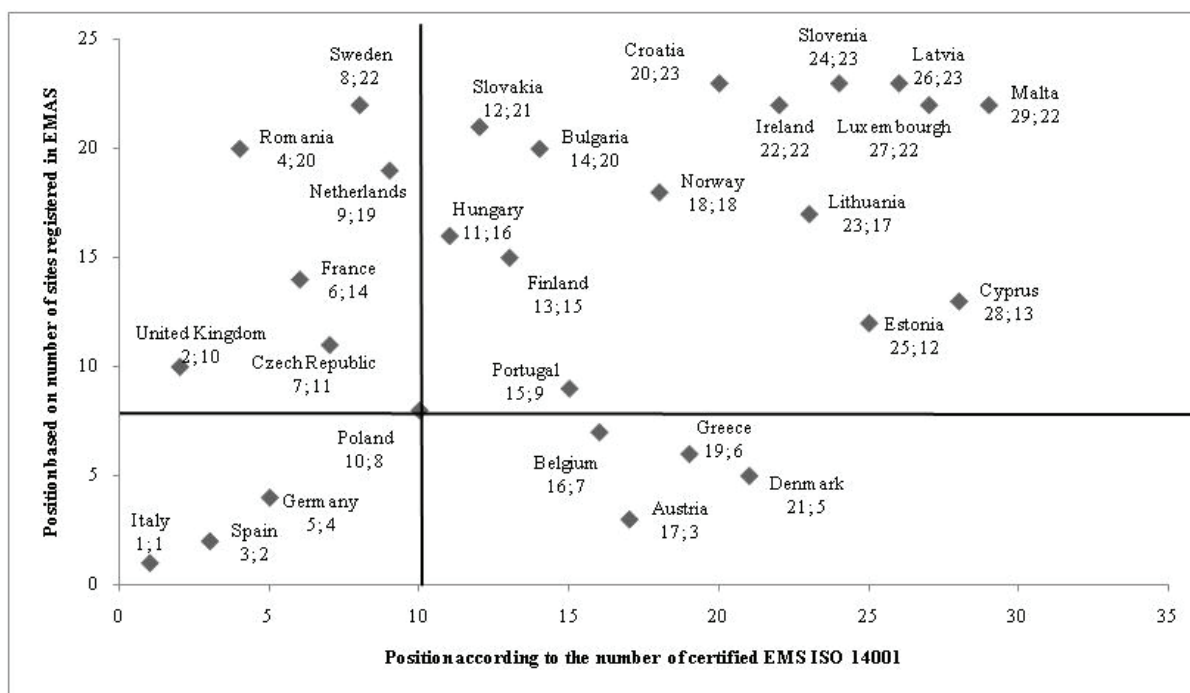


Figure 4. Positional collective absolute classification: EMAS and ISO 14001 in European countries in 2013

Source: own elaboration based on the data from ISO and EMAS Register

However considering the additional criterion, which is the population in the given country, classifications are undergoing certain changes. Such an additional criterion causes the greater objectivity of the ranking, because less populated countries have a smaller number of organisations and in the process weaker position in absolute classification. In the relative and absolute presentation in the ISO 14001 perspective the Czech Republic, Romania, Italy, Spain and Sweden and Great Britain are deserving the greatest attention as countries with the substantial amount of certified EMS ISO 14001 and at the same time the biggest number of certificates per million residents. In case of EMAS Austria, Italy and Denmark should be listed (there are no representatives of Eastern Europe here). Details of comparative classifications are in pictures No. 5 and 6. Considering both orders (absolute and relative) two countries are standing out: Italy and Spain, which are in leading places. These are the countries with the highest number of EMS ISO 14001 certificates and the registration in EMAS and with the highest number as for these systems per million residents. No other countries from the analysed set repeated this achievement.

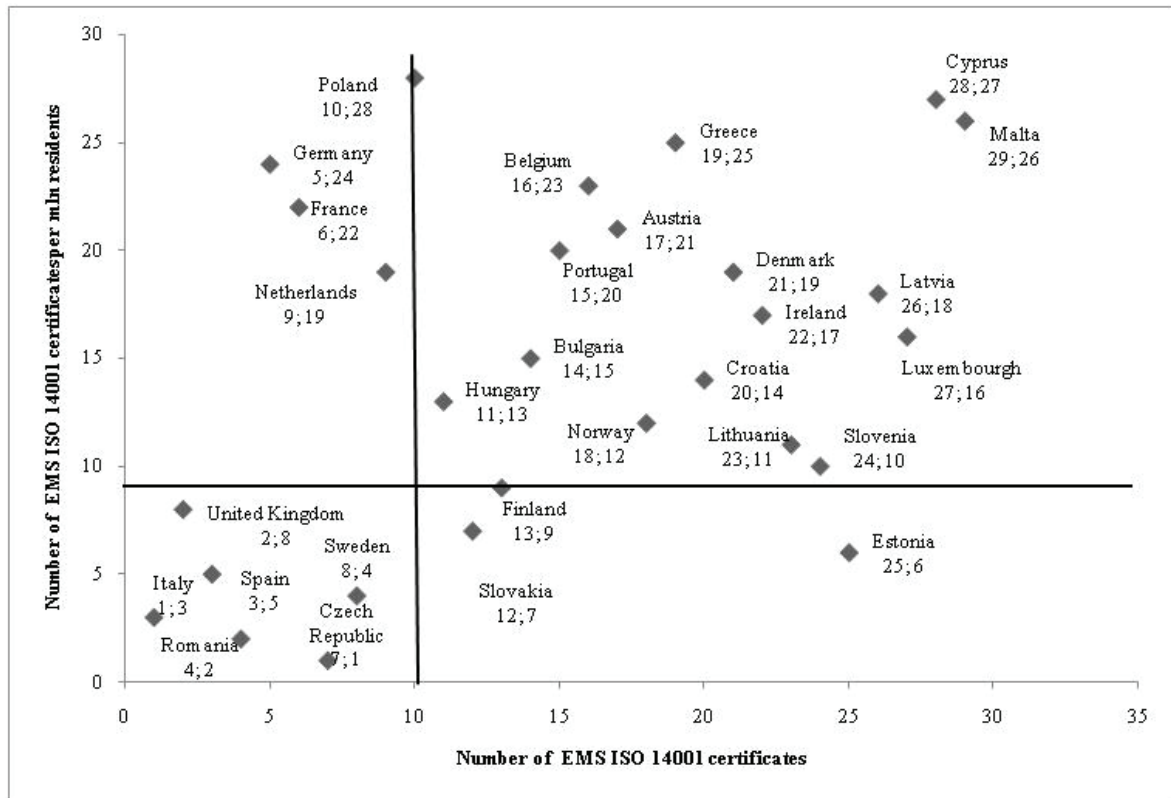


Figure 5. Comparative classification of countries on account of EMS ISO 14001 certificates and certificates per million of residents in European countries in 2013

Source: own elaboration on the based on data from ISO and EMAS Register

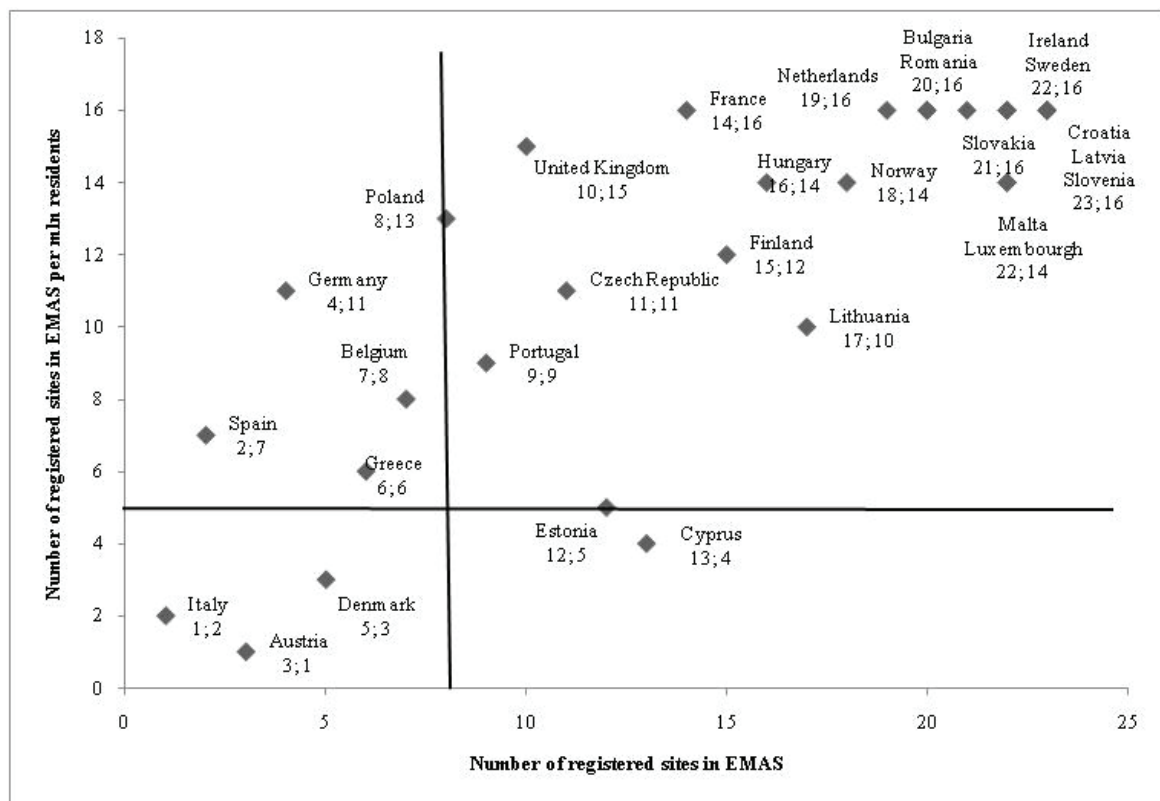


Figure 6. Comparative classification of countries on account of registered sites in EMAS and registration per million residents in European countries in 2013

Source: own elaboration based on data from ISO and EMAS Register

Conclusion

To sum up, it is possible to state that both EMS ISO 14001 certification as well as EMAS registration in the course of recent years are demonstrating increasing trend, although in the EMAS case, the increases are much smaller and the number reflecting implementations in individual years are much lower. Environmental Management Systems according to ISO 14001 seem to have a strong position, maintained for years and no symptoms indicating the change of the leader position were noted, EMAS isn't able currently or in the immediate future to approach to ISO 14001 if it is about a number of implementations.

Considering the perspective of various countries in 2013, Italy, Spain and Germany as well as Poland are most notable, as the countries, in which both EMAS registrations as well as EMS ISO 14001 certificates are on high level (first 30 % of places in positional classifications). Poland is the only representative of Eastern Europe in this circle. If it is about countries from this part of Europe, ISO 14001 is popular in Romania and the Czech Republic (appropriately 4th and 7th place), however underachieves EMAS in their case (distant places 11th and 20th). No other mattered positions of Eastern European countries were written down, taking into consideration the number of the certifications and the registrations. However converting absolute data per million of residents of the given country, Poland is declined on distant places (28 - ISO 14001 and 13 – EMAS). However in such a context Romania and the Czech Republic are coming out better if it is about ISO 14001 (appropriately 1st and 2nd place), in case of EMAS no country from Eastern Europe was ranked in the first 30 % of countries from positional classification, the closest is Estonia (5th place) however as for the absolute number of registrations it occupied distant 12th place. Looking at all analytical conceptualizations presented above, all classifications, Italy and Spain are these countries, which positioned themselves the highest in the largest number of classifications, deserve the highest attention. We should look for the answer as how to increase the popularity of the environmental management systems in other countries of Europe out there, it is worthwhile searching for the dialogue about the benefits and barriers associated with formalizing management systems out there and analysing found experience from Italy and Spain try to study and to come up with the conclusions being able to be applicable in other regions.

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APLINKOS APSAUGOS VADYBOS SISTEMOS: EUROPINĖ PERSPEKTYVA

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Santrauka

Straipsnyje apibrėžiamos ir analizuojamos esminės Europos alinkosaugos vadybos sistemų vertinimo tendencijos, jas sertifikuojant ir registruojant ISO 14001 ir EMAS (aplinkosaugos vadybos ir audito sistema) sertifikatais. Analizuoti 1999–2013 metų duomenys skirtingose Europos šalyse. Remtasi kiekybiniais reprezentatyviais duomenimis, taikant dokumentų analizę. Straipsnyje pateikiams aplinkosaugos vadybos sistemos diegimo augimo dinamika skirtingose šalyse, pateikiant sertifikatų skaičius ir registracijas, šiuos skaičius lyginant su gyventojų skaičiais konkrečiose Europos šalyse. Atlikta kiekybinė analizė, kuri atskleidė, kad įvertinus visas šalis atskleista augimo tendencija registruojant ir sertifikuojant šiais certifi-

katais. Atsižvelgiant į Europos šalių įvairovę, išsiskiria Italija ir Ispanija – tai šalys, kuriose daugiausia sertifikuota aplinkosaugos vadybos sistemų ISO 14001 ir registruota aplinkosaugos vadybos bei audito sistemų EMAS. Išryškėjo, kad lyginant šias dvi sertifikavimo sistemas, populiarsnė yra ISO 14001. Reikia ieškoti būdų, kaip didinti šių sistemų diegimo populiarumą ir kitose Europos valstybėse, nes tai pagerintų visų Europos šalių gyventojų gyvenimo kokybę.

PAGRINDINIAI ŽODŽIAI: *aplinkos apsaugos vadybos sistema, ISO 14001, EMAS (aplinkosaugos vadybos ir audito sistema)*

JEL KLASIFIKACIJA: M16; Q01; R11.