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THE GREEN TRANSITION OF SMALL AND MEDIUM BUSINESS IN BULGARIA – CURRENT OVERVIEW AND OUTLOOKS[4]

The conscious need of transition to an environmentally friendly way of society life on a global scale in recent years outlines a new direction in the development and activity of humanity. A number of documents at the global and European levels are a clear sign of countries' determination t change significantly their attitude to the natural resources use in order to limit climate change and global warming of the planet, to ensure an environmentally friendly way of life and activity and the long-term preservation and well-being of human civilization. Small and medium-sized businesses in Bulgaria are a huge potential resource that can be a powerful engine for realizing the ecological transformation of the country's economy.

Current progress, financial ability and access to financial resources as well as the outlooks of small and medium companies in Bulgaria in the green transition are analyzed in this study. SMEs are classified in 3 clusters in terms of their progress in the transition process using TwoStep Cluster analysis with a set of indicators identified by authors. It has been established that despite the existing difficulties and the great inertia in the process of transition to an ecological economy of small and medium-sized companies in particular, more or less sustainable steps leading to the reduction of carbon emissions are observed, in the production of cleaner energy as well as elements of circularity in production processes and consumption. The transition appears to be taking place more quickly in medium-sized companies operating in manufacturing, logistics and transport, while small, mostly family-owned, companies with businesses in retail or service are progressing more slowly in this process. All the companies need of more serious and adequate support in the way of ecologization both by state regulations that to be applied clearly and transparently and by adequate financing
Keywords: green transition; ecologization; small and medium-sized companies funding
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1. Introduction

The conscious need of transition to an environmentally friendly way of society life on a global scale in recent years, imposed as a result of unfavourable climate changes and irresponsible exploitation of the environment, outlines a new direction in the development and activity of humanity. The unscrupulous use of natural resources and the intense pollution of the environment as a result of human activity in recent decades have caused increasingly negative effects on the climate and ecosystems, both on a global scale and in the countries themselves and in Bulgaria in particular. A number of documents at the global and European level, starting with the United Nations Framework Convention on Climate Change, signed in 1992 and updated with the Paris Agreement, which entered into force in 2016, are a clear sign of countries' determination t change significantly their attitude to the natural resources use in order to limit climate change and global warming of the planet, to ensure an environmentally friendly way of life and activity and the long-term preservation and well-being of human civilization. Climate objectives remain at the heart of EU programs and policies, which is reflected in the EU-27 Multiannual Financial Framework (2021-2027), where 37% of recovery plan spending is dedicated to their implementation, as and in the specific actions of Member States.

Our country is no exception to the current global processes of ecologization, the main part of which is aimed at changing the economic model of societies, including sparing use of natural resources, production of clean "green" energy, priority development of energy-saving productions, secondary consumption and extending the life of manufactured goods. The green transition and the transition to a circular economy model are at the heart of this change. A number of policies and measures regarding climate and environmental protection and the transition of the economy to ecological foundations have been prioritized in the recovery and development plan of the country. For actual implementation of the policies and measures set, however, active political and legislative decisions and actions, specific programs and business strategies are needed to lead to the expected effective results.

Small and medium-sized businesses in our country are a huge potential resource that can be a powerful engine for realizing the ecological transformation of the economy. The creation and use of capacities from renewable energy sources, switching to energy-saving production, expanding the use of secondary resources, as well as creating conditions for extending the period of use of manufactured goods are important mechanisms that might contribute to changing the linear model of the country's economy into a circular one and making the "*green transition*". Of utmost importance for the successful realization of these activities is the creation of a favourable business climate for the development of small and medium-sized enterprises and the implementation of relevant projects aimed in this direction. An important component of the favourable business conjuncture supporting the development and prosperity of small and medium-sized companies is clear and sustainable legislation as well as regulations that guarantee transparency and clear rules and procedures. Along with these conditions, it is extremely important for the companies to have an accessible financial resource, which will be provided to them according to clear and sustainable rules, and in this way to make the "green" projects implementable.

A number of studies have been devoted in recent years to the problems related to ecologization, circular economy and "green" transition of European counties and Bulgaria (Camilleri, 2021, Cavallo, 2018, Chipeva, 2022, Clarkson, Lie, Richardson, Vasvari, 2008, Ivanova, 2015, 2016, 2018, Ivanova, Slavova, 2019, Ivanova, Chipeva, 2019, 2021, Pieroni, 2019). Attempts for measuring the progress of these processes based on different key statistical indicators are developed (Marin, 2014; Sneideriene, Viederyte, 2020; Zielinska, 2019). The role of state and private environmental expenditures in the green transition of EU countries has been studied (Chipeva, Ivanova, Velichkov, 2023). Studies on the problems of the ecological transformation and transition to the circular economy concerning small and medium companies in Europe and in Bulgaria in particular have not been met by now.

The aim of this study is to investigate and analyze the current progress, financial ability and access to financial resources as well as the outlooks of small and medium companies in Bulgaria in the green transition to ecologization of their activities including the use of "green" energy and technologies and reduce of carbon emissions that can limit the climate changes.

The research thesis is that despite the existing difficulties and great inertia in the process of transition to an ecological economy of the economy in general and small and medium companies in particular, certain steps are observed leading to carbon emissions reduce, cleaner energy-producing as well as partial elements of circularity in the production processes and consumption.

2. Data and Methodology

2.1. Data

Empirical data used in this study is based on a web-based sampling survey among the enterprises in Bulgaria with an accent on small and medium-sized companies conducted in October-December 2022 by the National Statistical Institute at the initiative of the Bulgarian Bank for Development. The online questionnaire was filled by the companies' managers. A sample of all the observed companies that met the criteria for small and medium-sized enterprises (up to 250 employed and either annual turnover up to 97,5 million BGN or a total balance of up to 84 million BGN) has been formed. A set of 554 companies have been included in the sample and involved in the current analysis respectively.

Data related to economic, financial and demographic specifics of the companies, to their attitude and progress on the way of the green transition, to their investments for ecologization of the production process as well as to needs for external funding and support, have been extracted from the questionnaire and are structured into appropriate variables.

2.2. Methodology

The methods applied in the study are mostly statistical and aim to explore the current situation and progress of small and medium companies in Bulgaria on the way of green transition, availability to financial resources and need for additional funding for the ecologization of their activities as well as outlooks of the processes. First, a multinomial classification of the

companies included in the analysis was carried out by applying cluster analysis. The classification was done using a set of 9 indicators (variables) presented in Table 1. Indicators were selected to present the attitude of the companies and the current progress in terms of their targets and activities for ecologization.

Table 1. Indicators used in the clusterization of the companies

No	Indicator	Statistical type of variable
1	Attitude to the green transition	nominal
2	Knowledge of green transition regulations	nominal
3	Awareness of the risks related to climate changes	nominal
4	Existence of a company strategy/policy for sustainability and climate neutrality	dichotomous
5	Implementation of international standards for environmental management (ISO or EMAS)	nominal
6	Existence of emission reduction targets, inc. greenhouse gases, energy efficiency, waste reduction and recycling	nominal
7	Program existence for energy consumption reduce, energy efficiency increase and saved energy accounting	nominal
8	Program existence for waste reduce	nominal
9	Investments planned for energy efficiency and RES	dichotomous

Since all the variables that correspond to the indicators under consideration are of categorical type, Two Step Cluster Analysis has been applied for the companies' classification. Unlike the usual cluster analysis, this procedure provides an opportunity to use categorical variables in the classifying process assuming they are mutually independent. By the procedure of Two-Step Cluster Analysis, the optimal number of clusters is defined automatically based on comparing the values of a model-choice criterion across different clustering solutions. Classification importance of variables used can be assessed within the procedure and it is ranged on a scale from 0 (least important) to 1 (most important).

The specifics of each identified cluster were analyzed based on the empirical distributions of the companies in terms of the classifying variables along with some demographic characteristics. Similarities and differences between clusters identified that are related to the preferred way of green transition, green projects planned and the financial potential of companies to realize them are outlined using cross tabs and appropriate summary characteristics.

The correlation between the main characteristics of companies and their progress and outlooks in the green transition for each identified cluster was analyzed.

Data processing and statistical methods were applied with SPSS, v.23. Results are presented in appropriate charts and tables.

3. Results and Discussion

Three clusters were identified based on the 9 selected indicators (Table 2). First cluster is the smallest and includes one-fourth of the companies in the study. The second cluster is the largest – it includes 44.8% of the companies.

Table 2. Clusters description

Cluster	Number of companies	% of sample
1st cluster	135	25.2
2nd cluster	239	44.8
3rd cluster	160	30.0

Source: Autor's calculations obtained by SPSS.

Cohesion of clusters was estimated as *fair* taking into account that all the input variables are of categorical type. Five of the input variables are of high importance for cluster identification while the importance of the rest four variables is not so significant (Figure 1).

Figure 1. Separation importance of input variables
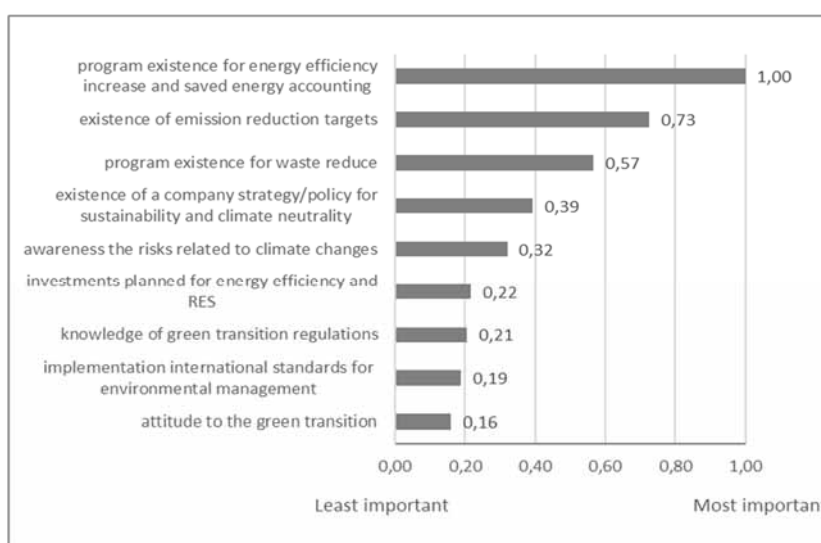
Source: Author's calculations.

The leading role of companies' clusterization plays program existence for energy consumption reduce, energy efficiency increase and saved energy accounting. Most companies implementing such programs are in the 1st cluster – 70.4% of all companies in the cluster (Figure 2). Almost all the rest of the companies in the cluster (28.1%) plan to invest in such programs and only 1.5% have no and do not plan to introduce in such programs. The opposite situation is presented in the 2nd cluster where 77.8% of the companies have no program energy efficiency. Only 10.5% of companies in this cluster implement such programs and 11.7% plan to make investments. The majority of the companies in the 3rd

cluster (90%) plan to invest in programs for energy efficiency but for now there are only 0.6% of them with such programs implementing.

Figure 2. Program existence for energy consumption reduce, energy efficiency and saved energy accounting in the companies
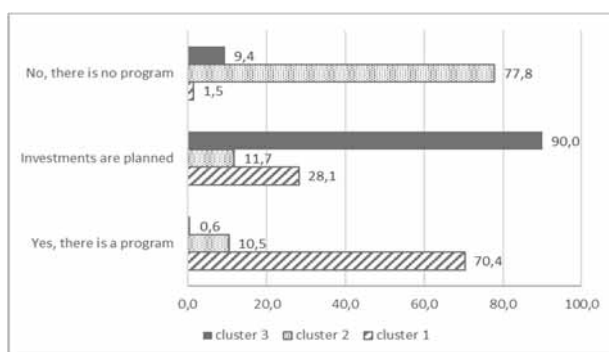
Source: Author's calculations.

There is also a significant difference between clusters in terms of emission reduction targets of companies, including GHG emissions reduction, energy efficiency, waste reduction and recycling. The largest percentage of companies that have such goals are in the 1st cluster – 74.8% (Figure 3). 86.6% of the companies in the 2nd cluster do not have and do not plan to set such goals and measures. Only 10% of the companies have the goals mentioned. Regarding the 3rd cluster, just over half of companies intend to set targets for emissions reductions, energy efficiency and waste reduction and recycling. Almost half of the rest have such goals while the others do not.

Figure 3. Existence of emission reduction targets in companies
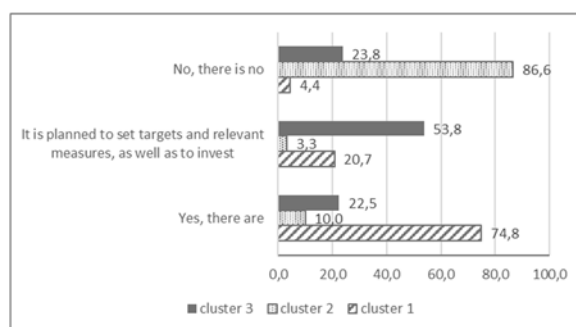
Source: Author's calculations

A similar situation in the clusters can be seen in relation to the other two indicators for progress of ecologization process used in the cluster procedure – existence of waste reduction programs and sustainability and climate neutrality strategy/policy in companies (Figure 4 and Figure 5).

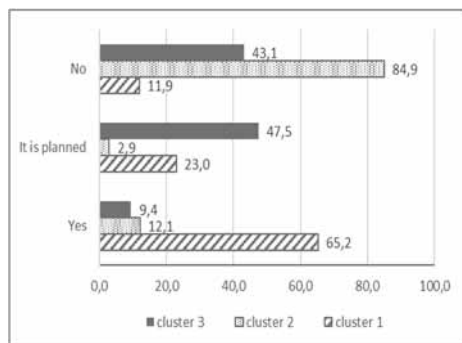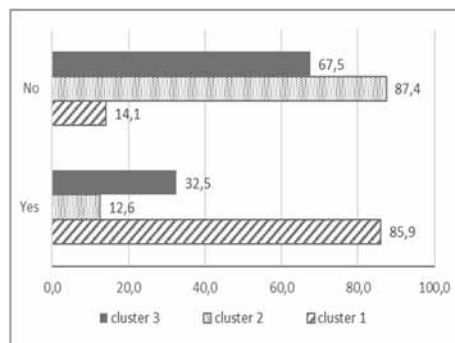### Figure 4. Program of waste reduce in companies

Figure 5. Company strategy/policy for sustainability and climate neutrality

Source: Author's calculations.

Most companies in all clusters are aware of the risk associated with climate change, but only a certain part of companies in the 1st cluster (35.6% of all in the cluster) have action plans developed (Figure 6). Almost one-third of companies in the 2nd cluster are not aware of this risk and only 0.4% of them have an action plan to reduce it.

Figure 6. Awareness of the risks, related to climate changes
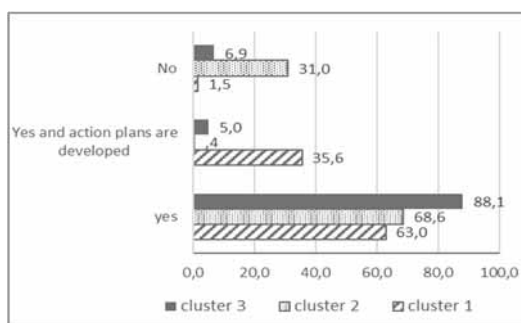
Source: Author's calculations

The remaining four indicators used in the analysis are not as much as important for the identification of the clusters, but they contribute to their final formation and help to emphasize some of their specifics. Above 75% of companies fallen in the 1st cluster see the green transition rather as an opportunity and plan investments mainly for energy efficiency and RES (Figure 7). More than 50% of them have knowledge of green transition regulations and implement international standards for environmental management. In contrast, almost half of the companies fallen in the 2nd cluster (48.1%) declare a lack of knowledge about the green transition and cannot define their attitude to it (Figure 7). Only 42.7% of them mention partly knowledge about the green transition. A significant part of these companies do not plan investments for energy efficiency and RES (72.8% of the companies in the cluster) and do not implement international standards for environmental management (67.4%).

Figure 7. Distributions of companies by the last four input indicators in the clusters
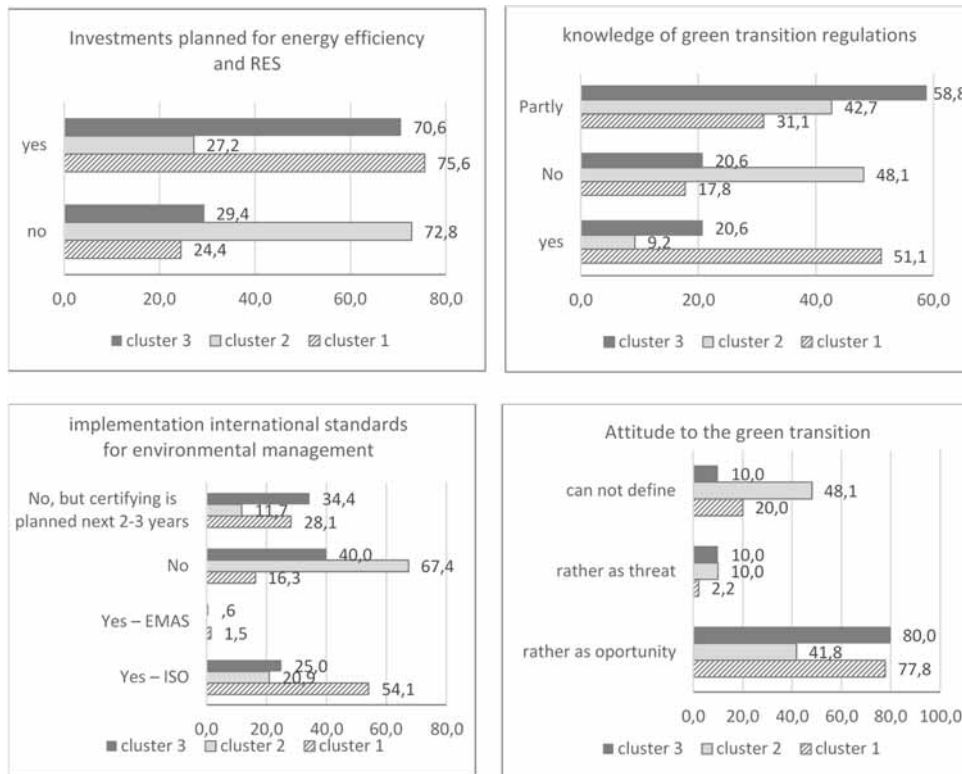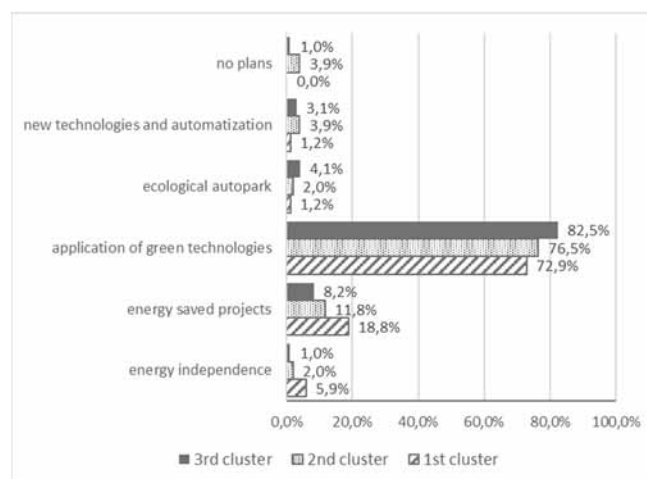

Source: Author's calculations

A significant part of the companies fallen in the third cluster (58.8%) also declare only partial knowledge on the green transition. At the same time, however, 80% of them regard on it rather as an opportunity and 70.6% plan investments for energy efficiency and RES (Figure 7). The majority of companies do not apply yet international environmental management standards, but 34.4% plan to become certified in the next 2-3 years.

Almost all the small and medium-sized companies in Bulgaria plan to realize *green* projects next year (Figure 8). The application of *green* technologies in common is most preferred by the majority of SMEs in all the clusters. Depending on the specific companies' activities, the technologies could be different but all of them aim for ecologization and green transition. Energy-saving projects are mostly preferred, where the companies from the first cluster are in the leadership position. The first cluster also has a leading position in terms of energy independence projects. The proportion of companies that do not yet have plans to adopt green technologies is too small. The usual reasons for this are either the specifics of their activity, which is not directly related to greening, or the lack of opportunity to undertake such changes.

Figure 8. Priority green projects planned by companies in the next year

Source: Author's calculations

The green transition way preferred by almost all small and medium-sized companies in Bulgaria is the implementation of energy efficiency measures, followed by renovation of equipment and building stock (Table 3). These preferences concern more so the companies in third and first clusters and rather less the companies in the second cluster. The smallest part of all companies, less than 3%, consider the new business launching as the appropriate way for a green transition.

Table 3. Preferred way for green transition (%)

Ways preferred for green transition:	1st cluster	2nd cluster	3rd cluster	Total
transfer of existing technologies	21.8	13.5	19.2	17.4
creation of new technologies	28.6	18.9	27.6	24.1
building stock renovation	39.8	25.7	44.9	35.2
renovation of equipment	48.1	37.4	45.5	42.7
business model change	10.5	8.1	10.3	9.4
new business launch	1.5	3.2	2.6	2.5
energy efficiency measures	58.6	50.5	62.2	56.2

Source: Author's calculations

The realization of the green transition is related more or less to a reorganization of companies' activities and requires usually additional/external financing. Only 8% of all surveyed companies do not need external financing to implement their greening programs, with the smallest share of companies from the 3rd cluster, and the largest number of companies that need external financing are in the 2nd cluster (Table 4). Most companies need financing for investments and working capital. More than 60% of the companies in the first and third cluster need credits to make investments in their business while they are about 45% in the second cluster. Companies in the first cluster mostly need credits for investments

(61.5%), working capital (43%) and energy efficiency and RES (42.2%) and least for export their production. The situation is similar with the companies from the third cluster. Their credit needs are mostly for investments (63.5%), energy efficiency and RES (44.7%) and working capital (40.9%). The credit needs of the companies from the second cluster are smaller in common view compared to the rest of the companies and are mostly aimed at acquiring working capital (54.2%) and investments (45.4%).

Table 4. Main areas where companies need external funding (%)

Needs of credit for:	1st cluster	2nd cluster	3rd cluster	Total
no need of external financing	7.4	11.8	2.5	8.0
working capital	43.0	54.2	40.9	47.6
investments	61.5	45.4	63.5	54.5
energy efficiency and RES	42.2	13.9	44.7	29.7
innovations	28.1	15.1	26.4	21.7
export	5.2	2.5	6.3	4.3
other	3.7	2.1	0.6	2.2

Source: Author's calculations

Almost 18% of small and medium sized companies prefer to use equity capital for financing their programs and activities related to ecologization and green transition (Table 5). The share of companies that rely on their own financing is significantly larger in the second cluster – almost a quarter of companies included in the cluster. Companies that do not need external financing in the other two clusters are around 13-14%. The most preferred external source of financing by all the SMEs are banks. A significant part of companies (around one-fifth) preferred to use family savings. The first cluster stands out from the others with a relatively larger share of companies that would use easy credit to finance their green activities while the third cluster differs with relatively more companies that would use equity funds for this purpose.

*Table 5. Sources of funding preferred by the small and medium companies (%)*

Sources of funding:	1st cluster	2nd cluster	3rd cluster	Total
banks are usual source of financing	78.5	69.7	79.9	75.0
non-bank financial institutions (leasing, factoring, others) are usual source of financing	15.6	10.1	12.6	12.2
family savings	21.5	16.8	20.1	19.0
easy credits	3.0	0.4	0.6	1.1
equity funds	0.7	0.8	3.1	1.5
external funding is not preferred	14.1	23.1	13.2	17.9

Source: Author's calculations

Distributions of companies by the number of employees and by the annual turnover in the clusters identified are rather similar, especially concerning 1st and 3rd clusters (Figure 9). Small companies prevail in all the clusters, but in the 1st and 3rd clusters, they don't exceed half of the respective group while in the 2nd cluster they are above 60%. Taking into account the largest size of cluster 2 it is clear that most small companies are included in it.

Accordingly, in this cluster, the share of companies with the least number of employees and the lowest annual turnover is the largest.

Figure 9. Companies' distributions by number of employed and by annual turnover
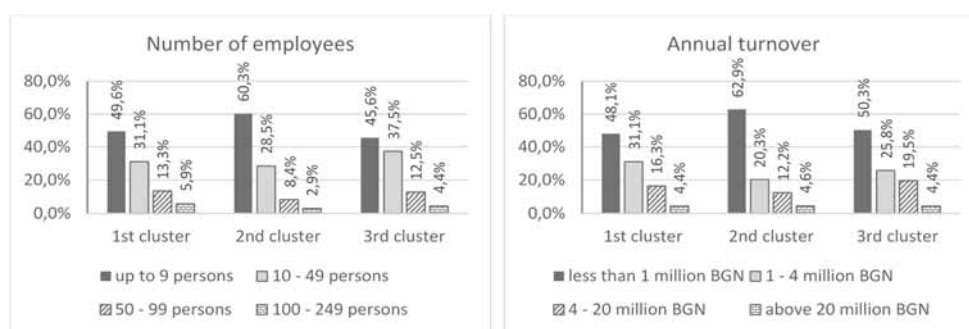
Source: Author's calculations.

Table 6. Chi-Square test and Cramer's correlation coefficient (V) between the company's number of employees and indicators for green transition used in the study

Indicator:	Cluster	Sig.of Chi-Square test	Cramer's V	Sig.of V
attitude to the green transition	1	0.560	0.190	0.560
	2	0.462	0.154	0.462
	3	0.067	0.271	0.067
knowledge of green transition regulations	1	0.821	0.147	0.821
	2	0.315	0.172	0.315
	3	0.830	0.133	0.830
awareness of the risks related to climate changes	1	0.825	0.146	0.825
	2	0.208	0.188	0.208
	3	0.922	0.111	0.922
existence of a company strategy/policy for sustainability and climate neutrality	1	0.031	0.256	0.031
	2	0.919	0.043	0.919
	3	0.107	0.195	0.107
implementation of international standards for environmental management (ISO or EMAS)	1	0.000	0.341	0.000
	2	0.000	0.241	0.000
	3	0.000	0.270	0.000
existence of emission reduction targets, inc. greenhouse gases, energy efficiency, waste reduction and recycling	1	0.746	0.114	0.746
	2	0.891	0.069	0.891
	3	0.166	0.169	0.166
program existence for energy consumption reduce, energy efficiency increase and saved energy accounting	1	0.738	0.115	0.738
	2	0.012	0.186	0.012
	3	0.044	0.201	0.044
program existence for waste reduce	1	0.394	0.152	0.394
	2	0.093	0.151	0.093
	3	0.258	0.156	0.258
investments planned for energy efficiency and RES	1	0.439	0.142	0.439
	2	0.014	0.210	0.014
	3	0.796	0.080	0.796

Source: Author's calculations.

Most of the indicators used in the study for expressing the progress of companies in greening do not correlate with the annual turnover of the companies and the number of employees in them. Only the implementation of international standards for environmental management (ISO or EMAS) correlates with both the number of employees and annual turnover of the companies in all the clusters (Table 6 and Table 7).

Regarding companies in cluster 1, the presence of a sustainability and climate neutrality strategy/policy depends on the number of employees and annual turnover, although not rather strongly. Regarding the 2nd cluster, having a program to reduce energy consumption, increase energy efficiency and account for saved energy depends to some extent on both the number of employees and the annual turnover of the companies, and the number of employees has also some influence on planned investments for energy efficiency and RES. The number of employees of the companies in the 3rd cluster has some influence on having a program to reduce energy consumption, increase energy efficiency and account for saved energy, while their annual turnover has a weak influence on the attitude of companies to the green transition.

Table 7. Chi-Square test and Cramer's correlation coefficient (V) between the company's annual turnover and indicators for green transition used in the study

Indicator:	Cluster	Sig.of Chi-Square test	Cramer's V	Sig.of V
attitude to the green transition	1	0.671	0.122	0.671
	2	0.177	0.137	0.177
	3	0.026	0.213	0.026
knowledge of green transition regulations	1	0.424	0.149	0.424
	2	0.373	0.117	0.373
	3	0.806	0.097	0.806
awareness of the risks related to climate changes	1	0.922	0.086	0.922
	2	0.981	0.049	0.981
	3	0.783	0.100	0.783
existence of a company strategy/policy for sustainability and climate neutrality	1	0.066	0.231	0.066
	2	0.931	0.043	0.931
	3	0.709	0.093	0.709
implementation of international standards for environmental management (ISO or EMAS)	1	0.000	0.308	0.000
	2	0.009	0.190	0.009
	3	0.009	0.215	0.009
existence of emission reduction targets, inc. greenhouse gases, energy efficiency, waste reduction and recycling	1	0.609	0.129	0.609
	2	0.847	0.075	0.847
	3	0.484	0.131	0.484
program existence for energy consumption reduce, energy efficiency increase and saved energy accounting	1	0.887	0.093	0.887
	2	0.018	0.180	0.018
	3	0.301	0.151	0.301
program existence for waste reduce	1	0.104	0.198	0.104
	2	0.647	0.094	0.647
	3	0.756	0.104	0.756
investments planned for energy efficiency and RES	1	0.896	0.067	0.896
	2	0.451	0.105	0.451
	3	0.289	0.154	0.289

Source: Author's calculations.

4. Conclusions

Based on the empirical analysis conducted it can be concluded that most small and medium-sized companies in Bulgaria have started the green transition process. There are a significant number of companies that are cutting-edge, and they are already well along the way. At the same time, there are companies that have not yet seriously realized the new world trends of greening and transformation of the economy to a circular model on a global scale and have not started or are at the very beginning of the green transition path.

According to the results of cluster analysis applied in the study, small and medium-sized companies in Bulgaria could be classified into 3 clusters. The largest cluster (cluster 2) significantly differs from the rest both by the economic profile of the companies included and by the progress in the green transition. This cluster embeds almost half of the studied companies most of which are small-sized. Almost half of the companies in the cluster cannot define yet their attitude to the green transition and have no knowledge of regulations related to it. A significant number of companies have no programs for energy efficiency increase including energy consumption reduce, waste reduce and emission reduction targets. Most of them have no strategy/policy for sustainability and climate neutrality, do not implement international standards for environmental management and do not plan investments for energy efficiency and RES. The business of these companies, most of which are family-owned, is in the field of trade or services. Of course, activities in these sectors do not exclude the introduction and use of green technologies, as well as environmentally friendly measures related to waste reduction, use of clean energy, etc. Companies in this cluster seem to be at the beginning of the way to the green transition and need more support both through appropriate policies and measures from the state and through the necessary proper financing.

The remaining two clusters have a similar structure in terms of the economic specifics of the companies in them. However, one of them (cluster 1) is leading in relation to the programs of energy efficiency developed including energy consumption reduce, waste reduce and else. A very large part of the companies in this cluster have emission reduction targets and strategy/policy for sustainability and climate neutrality set. More than half of companies have knowledge about green transition regulations and implement international standards for environmental management. Above 75% of companies plan to invest in energy efficiency and RES in the near future. This cluster is emerged as a leader in the process of economic ecologization and green transition.

The companies included in the last cluster (cluster 3) could rather be defined as having taken the path of the green transition, but there is still much to be done. Most of the companies in the cluster have not yet had emission reduction targets set and strategy/policy for sustainability and climate neutrality adopted. A significant part of companies has not yet programs developed for energy efficiency, included energy consumption and waste reduce. However, many of them plan to set targets for emission reduce and to make investments both for energy efficiency and RES and for waste reduce. A very large part of the companies are aware of the risk related to climate changes, but only 5% of them have action plans developed to reduce this risk and one-fourth of them implement international standards for environmental management. Almost 80% of the companies know the regulations of green transition or have partial knowledge about them and regard at it rather as new opportunities

for their business. It can be concluded that the companies in this cluster as a whole have already taken certain steps on the path of green transition. Of course, some of them are more ahead within the cluster regarding their progress in the greening, but compared to the companies from the other clusters, it can be said that they are in the middle of the way.

Over 90% of the companies in the survey report that they need external financing to make the green transition, with the lowest proportion of companies in Cluster 3 and the largest one in Cluster 2. Companies in the 1st and 3rd clusters need of funding mostly for investments, while the companies in the 2nd cluster needs external financing are mostly for working capital. Most companies look for credits predominantly from banks but a significant part of them rely also on family savings.

The number of employees and the annual turnover of companies generally correlate with the implementation of international environmental management standards, and in some companies, they also have an impact in terms of energy efficiency programs.

The general conclusion of the analysis is that a significant part of the small and medium-sized companies in Bulgaria have made more or less progress towards the green transition and the greening of the economy. The transition appears to be taking place more quickly in medium-sized companies operating in manufacturing, logistics and transport, while small, mostly family-owned, companies with businesses in retail or service are progressing more slowly in this process. However, all the companies need more serious and adequate support in the way of ecologization both by state regulations that are to be applied clearly and transparently and by adequate financing.

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