

Current State, Best Practices and Research Findings at State Level (Cyprus)



Prepared by Cyprus University of Technology

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1. Introduction

With the development of the circular economy agenda, the European Commission has spelled out specific aims for achieving resource efficiency in the EU’s economic model.

In a circular economy, the value of products and materials is maintained for as long as possible. Waste and resource use are minimized, and when a product reaches the end of its life, it is used again to create further value. This can bring major economic benefits, contributing to innovation, growth and job creation. A circular economy encourages sustainability and competitiveness in the long term. It can also help to:

- preserve resources – including some which are increasingly scarce, or subject to price fluctuation
- save costs for European industries
- unlock new business opportunities
- build a new generation of innovative, resource-efficient European businesses – making and exporting clean products and services around the globe
- create local low and high-skilled jobs
- create opportunities for social integration and cohesion

Action at EU level can drive investment, create a level playing field, and remove obstacles stemming from European legislation or its inadequate enforcement.

On 2 December 2015, the European Commission put forward a package to support the EU's transition to a circular economy. On 4 March 2019, the Commission reported on the complete execution of the action plan. All 54 actions included in the 2015 plan have now been delivered or are being implemented. This will contribute to boost Europe's competitiveness, modernise its economy and industry to create jobs, protect the environment and generate sustainable growth.

Research and innovation are key to enabling the transition to a circular economy and to boost the competitiveness of EU industry.

Public and private investments are necessary to make it happen. Horizon 2020, COSME, the Structural and Investment Funds, the Fund for Strategic Investments and other EU programmes are important support instruments at the EU level. SMEs, including social enterprises, are particularly active in fields such as recycling, repair and innovation. They play an important role in the development of a more circular economy.

The Commission:

- is helping SMEs benefit from the business opportunities of increased resource efficiency with the creation of the European Resource Efficiency Excellence Centre
- the Horizon 2020 work programme for 2018-2020 includes a major initiative on 'Connecting economic and environmental gains' focused on the circular economy with funding of €941 million
- together with the EIB, and the European Investment Advisory Hub, has encouraged applications for funding and supported the development of projects relevant to the circular economy
- has established a monitoring framework that will help to track progress in the transition to the circular economy at EU and national level, based on ten indicators covering all the above-mentioned phases and aspects.

The green action plan for SMEs adopted in July 2014 was designed to complement the circular economy package. Cyprus does have several advantages and assets that can be proven pivotal in the enhancement and the fostering of entrepreneurship and in the development of an entrepreneurship ecosystem, which in turn could invigorate an economic growth in the next decade. Furthermore, Cyprus has an excellently educated workforce and Cypriots rank first in EU27 in their dream of being self-employed. However, the gap between their dream and belief in achieving it is wide. An entrepreneurship ecosystem could help close this gap by fostering innovation and start-ups. Entrepreneurship in Cyprus is not new, as 98% of the companies in Cyprus are small to medium enterprises. Our time frame for fostering and reigniting entrepreneurship in Cyprus is the year 2020, which aligns also with the EU2020 agenda.

1.1. Eco-innovation

Eco-innovation is a key element because it increases value for both producers and consumers while reducing negative impacts on the environment. In a global context, where change is increasing and innovation is disruptive, sources of competitive advantage must be created, and differentiation strategies must be developed through eco-innovation. Investment in eco-innovation enables firms not only to gain a privileged market position but also to maintain this position in the long term. If firms are unable to compete through cost, they can compete through innovation. The trend is positive and increasing, and the data reflect the tertiarization of the economy. Therefore, eco-innovation should not be overlooked in service sectors. In the ecological domain, these innovations may originate by viewing the environment as an engine for strategic change. Eco-innovations can take place in three business areas:

A. Process innovations

These innovations relate to the production of goods and services. The goal is usually to enhance eco-efficiency. In most cases, these improvements are based on the use of more environmentally-friendly production technologies.

B. Organizational innovations

These innovations relate to restructuring within the companies. These innovations primarily concern employees and the organization of their work tasks. New forms of management such as the adoption of environmental management models also fall into this category.

C. Product innovations

These innovations refer to the development of a completely new product or service or the improvement of an existing product or service. For example, ecological design could offer a good alternative to producing products that use natural resources more efficiently. The use of recycled organic materials is an example of the improvement of an existing product. The development of long-term sustainable environmental technologies such as renewable energy technologies entails the development of new products in the market.

1.2. Ecopreneurship

The term ecopreneurship is a portmanteau word formed from combining the form eco (as in ecological) and entrepreneurship. The term eco comes from the Greek word eikos, which literally translates as home. Ecology is the branch of science that studies how our home functions in the sense of our environment and surroundings. People's interest in taking care of and preserving biological resources has increased in response to a model of production that consumes natural resources more quickly than they can recover. Under such a model, resources are depleted more quickly than they are replenished. Entrepreneurship, on the other hand, is generally defined as the discovery of gaps in the market in which entrepreneurs are capable of spotting and exploring new business opportunities. Thus, ecopreneurship is the search for new opportunities that help protect the environment in pursuit of environmental sustainability. Chopra defines ecopreneurship as “entrepreneurship through an environmental lens”.

Ecopreneurship is related to the economic concept of the common good, which refers to fostering and imparting the human values of dignity, solidarity, sustainability, social justice, democracy, and transparency. The economy of the common good has a broad scope and covers principles that concern not only people but also the environment. The companies' goal is to conduct its business activities without negatively affecting people and the environment.

Ecopreneurship cannot be understood without considering innovation. Ecopreneurship and innovation are two distinct yet interrelated concepts that have a symbiotic relationship in the context of environmental development. The Environmental Technology Action Plan (ETAP), which was adopted by the European Commission (EC) to promote eco-innovation and the use of environmental technologies, defines environmental innovation as follows: “the production, assimilation, or exploitation of a novelty in products, production processes, services, or in management and business methods, which aims, throughout its life cycle, to prevent or substantially reduce environmental risk, pollution, and other negative impacts of resource use (including energy).”

2. Summary of Eco Innovation current state in EU

The Eco-Innovation Scoreboard (Eco-IS) and the Eco-Innovation Index illustrate eco-innovation performance across the EU Member States. They aim at capturing the different aspects of eco-innovation by applying 16 indicators grouped into five dimensions: eco-innovation inputs, eco-innovation activities, eco-innovation outputs, resource efficiency and socio-economic outcomes. The Eco-Innovation Index shows how well individual Member States perform in different dimensions of eco-innovation compared to the EU average and presents their strengths and weaknesses. The Eco-IS and the Eco-Innovation Index complements other measurement approaches of innovativeness of EU countries and aims to promote a holistic view on economic, environmental and social performance. Thus, the trends across EU28 are shown by the 2018 Index below. Unfortunately, Cyprus ranks in the last place. In this Report findings from GEM Cyprus Reports 2016/2017 and 2017/2018 are used for analyzing Entrepreneurship and Eco-Innovation key parameters in Cyprus.

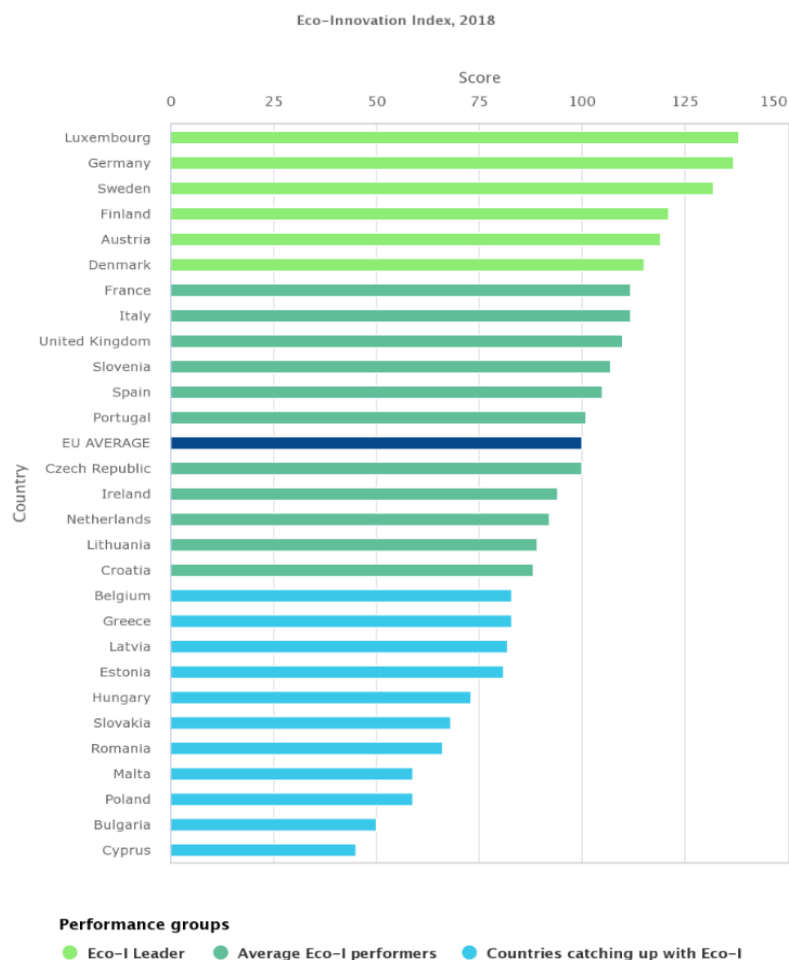


Figure 1 Eco-Innovation Index, 2018 [Source: European Commission]

3. Entrepreneur activity in Cyprus

According to GEM National Reports for Cyprus, in 2016/2017, 72.7% of the Cyprus sample considered entrepreneurship as a good career choice, whereas the corresponding average in Europe was 57.2%. Although the 2017/2018 average rate in Europe remains relatively stable (58.5%), there is a notable decrease in Cyprus’ corresponding rate (66.2%). Similarly, in 2016/2017, 65.7% of the Cyprus sample population considered that successful entrepreneurs enjoy a high status, whereas the corresponding 2017/2018 rate is 61.5%. Compared to 2016/2017, in 2017/2018 media attention for entrepreneurship was 8% higher in Cyprus, whereas the corresponding rate in Europe remained stable. The above results could be attributed, at least in part, to the increased ‘media attention for entrepreneurship’ recorded in this year’s survey. Increased media attention might have provided entrepreneurs the opportunity to share the obstacles, difficulties and often failures experienced in their entrepreneurial endeavors, in addition to their success stories. Such enhanced attention might have given the population at large a more pragmatic picture of how entrepreneurial endeavors unfold; it has thus possibly lowered the expectations and over-optimistic perceptions on entrepreneurship. Exploring the entrepreneurial culture provides useful insights into a country’s entrepreneurial intentions. In addition to this, GEM also collects data on self-perceptions about entrepreneurship as these can serve as indicators of national entrepreneurial intentions. Figure below summarizes self-perceptions about entrepreneurship in Cyprus and Europe for the time periods 2016/2017 and 2017/2018.



Figure 2 Self-perceptions about entrepreneurship in Cyprus and in Europe
[Source: GEM Cyprus Report 2017/2018]

As shown, in 2017/2018, about one in two adults in Cyprus (51%) believes that there are good opportunities to initiate entrepreneurial activity. Interestingly, last year’s figure was

35.9%. A rise in “perceived opportunities” is also recorded in the European average rate of 41.4%, compared to 2016/2017. The improved perceptions regarding opportunities to initiate entrepreneurial activity could be attributed to the improved economic conditions in both Cyprus and Europe compared to last year. Despite the above, the 2017/2018 figure for perceived capabilities for initiating entrepreneurial endeavors in Cyprus (46.4%), is lower than last year, when 52.4% of adults considered that they had the required skills and knowledge to start a business. The European average on the same indicator remained stable over the same period. Overall, compared to other European countries participating in GEM 2017/2018, Cypriots seem to be more optimistic about their capabilities to initiate entrepreneurial activity. This can potentially be attributed to the fact that the majority of entrepreneurs in Cyprus have received tertiary education (see Figure above) or even to aspects of self-perception influenced by culture and tradition. This positive perception about capabilities in Cyprus is also reflected in the direct measurement of entrepreneurial intentions. Entrepreneurial intention captures the expressed intention of the individual to initiate entrepreneurial activity in the next three years. The entrepreneurial intention rate in Cyprus is higher than the corresponding benchmark rate of the rest of Europe in both 2016/2017 and 2017/2018. This could be related to the supportive national legal and tax framework as well as to the existence of highly skilled human capital. Despite the positive perceptions about opportunities, capabilities and entrepreneurial intentions recorded in the country however, a large percentage of the population expressed a fear of failure related to entrepreneurial activity. Specifically, in 2017/2018 more than one in two adults expressed such a fear (55.9%). We note that the reported rate is higher than the corresponding European average for both 2016/2017 and 2017/2018. This might signal that Cypriots are more risk-averse compared to the average European, although the risk-averseness of the population was not explicitly measured by the GEM APS.

3.1. Societal Values and Perceptions about entrepreneurship

Societal attitudes, beliefs and perceptions about entrepreneurship are not directly related to the entrepreneurial process. However, these factors can serve as proxies for the entrepreneurial culture of a country. Positive or negative societal perceptions about entrepreneurship can have a notable impact on entrepreneurial ambition and willingness to engage in entrepreneurial activity. GEM examines societal values about entrepreneurship by measuring the perceptions of individuals about entrepreneurship. In particular, it provides insights on whether entrepreneurship is perceived as a good career choice, the status of successful entrepreneurs and the extent to which entrepreneurship receives adequate media attention. Figure 3 summarizes the results on societal values about entrepreneurship in both Cyprus and Europe, based on the 2016/2017 and 2017/2018 surveys.

Overall, the European average for social values and perceptions on entrepreneurship remain relatively similar in the 2016/2017 and 2017/2018 surveys. However, there is a notable drop in corresponding values in Cyprus since last year’s survey. For instance, in 2016/2017, 72.7% of the Cyprus sample considered entrepreneurship as a good career choice, whereas the corresponding average in Europe was 57.2%.



Figure 3 Societal values about entrepreneurship in Cyprus and Europe
[Source: GEM Cyprus Report 2017/2018]

Although the 2017/2018 average rate in Europe remains relatively stable (58.5%), there is a notable decrease in Cyprus’ corresponding rate (66.2%). Similarly, in 2016/2017, 65.7% of the Cyprus sample population considered that successful entrepreneurs enjoy a high status, whereas the corresponding 2017/2018 rate is 61.5%. Compared to 2016/2017, in 2017/2018 media attention for entrepreneurship was 8% higher in Cyprus, whereas the corresponding rate in Europe remained stable. The above results could be attributed, at least in part, to the increased ‘media attention for entrepreneurship’ recorded in this year’s survey.

Increased media attention might have provided entrepreneurs the opportunity to share the obstacles, difficulties and often failures experienced in their entrepreneurial endeavors, in addition to their success stories. Such enhanced attention might have given the population at large a more pragmatic picture of how entrepreneurial endeavors unfold; it has thus possibly lowered the expectations and over-optimistic perceptions on entrepreneurship. Exploring the entrepreneurial culture provides useful insights into a country’s entrepreneurial intentions. In addition to this, GEM also collects data on self-perceptions about entrepreneurship as these can serve as indicators of national entrepreneurial intentions.

Figure 4 summarizes self-perceptions about entrepreneurship in Cyprus and Europe for the time periods 2016/2017 and 2017/2018. As shown, in 2017/2018, about one in two adults in Cyprus (51%) believes that there are good opportunities to initiate entrepreneurial activity. Interestingly, last year’s figure was 35.9%. A rise in “perceived opportunities” is also recorded in the European average rate of 41.4%, compared to 2016/2017.



Figure 4 Self-perceptions about entrepreneurship in Cyprus and Europe
[Source: GEM Cyprus Report 2017/2018]

The improved perceptions regarding opportunities to initiate entrepreneurial activity could be attributed to the improved economic conditions in both Cyprus and Europe compared to last year. Despite the above, the 2017/2018 figure for perceived capabilities for initiating entrepreneurial endeavors in Cyprus (46.4%), is lower than last year, when 52.4% of adults considered that they had the required skills and knowledge to start a business. The European average on the same indicator remained stable over the same period.

Overall, compared to other European countries participating in GEM 2017/2018, Cypriots seem to be more optimistic about their capabilities to initiate entrepreneurial activity. This can potentially be attributed to the fact that the majority of entrepreneurs in Cyprus have received tertiary education even to aspects of self-perception influenced by culture and tradition. This positive perception about capabilities in Cyprus is also reflected in the direct measurement of entrepreneurial intentions. Entrepreneurial intention captures the expressed intention of the individual to initiate entrepreneurial activity in the next three years⁴.

The entrepreneurial intention rate in Cyprus is higher than the corresponding benchmark rate of the rest of Europe in both 2016/2017 and 2017/2018. This could be related to the supportive national legal and tax framework as well as to the existence of highly skilled human capital. Despite the positive perceptions about opportunities, capabilities and entrepreneurial intentions recorded in the country however, a large percentage of the population expressed a fear of failure related to entrepreneurial activity. Specifically, in 2017/2018 more than one in two adults expressed such a fear (55.9%). We note that the reported rate is higher than the corresponding European average for both 2016/2017 and 2017/2018. This might signal that Cypriots are more risk-averse compared to the average European, although the risk-averseness of the population was not explicitly measured by the GEM APS.

3.2. Total Early-Stage Entrepreneurial Activity (TEA)

The Total Early-Stage Entrepreneurial Activity (TEA) Index is a measure of a country's early-stage entrepreneurial activity. The TEA Index includes both nascent entrepreneurs (currently actively working on starting a new business) and new business owners. The TEA index is important as it reflects on the new businesses that could later become established and hence it represents a country's entrepreneurial potential. In 2016/2017, 12.0% of Cypriot respondents aged between 18 and 64 are classified as TEA entrepreneurs whereas in 2017/2018, only 7.3% of the population were classified as such. The difference in TEA index rates between the two time periods could be attributed to the constantly improving economic conditions in Cyprus over the past year. According to Eurostat, there has been a decrease in the unemployment rates from 13.1% in 2016 to 11.1% in 2017. It is considered that the increase in job opportunities and improved economic conditions has enhanced the perceived job security of the population. As a result, part of the population has abandoned entrepreneurial endeavors which were at a very early-stage and has switched attention towards more secure employment options. This conclusion is also supported by evidence in the GEMs report, clarifying that the majority of entrepreneurs that have abandoned their entrepreneurial activity were nascent entrepreneurs rather than new business owners. Further, as already stated above, increased media attention has possibly brought to the fore some of the difficulties that entrepreneurs might incur as well as the required long-term commitment to enjoy the benefits of any entrepreneurial activity.

The average TEA index rate across Europe was 8.4% in 2016/2017 and 8.1% in 2017/2018. Compared to other European countries participating in GEM 2017/2018, Cyprus ranks 11th in terms of its TEA Index. The TEA Index is particularly high in Estonia (19.4%), Latvia (14.2%), Canada (18.8%), Thailand (21.6%) and Lebanon (24.1%).

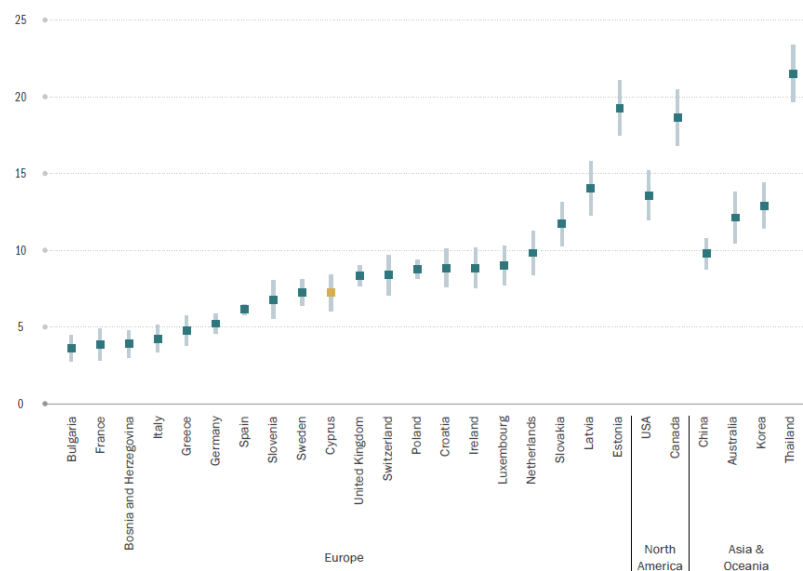


Figure 5 Self-perceptions about entrepreneurship in Cyprus and Europe
[Source: GEM Cyprus Report 2017/2018]

Both in Cyprus and Europe, the largest amount of TEA is recorded in the Wholesale and Retail sectors. In particular, in Cyprus, about one in two (45.4%) early-stage entrepreneurs relate their activity to the Wholesale and Retail sectors, whereas in Europe the corresponding average rate is 27%. The second most popular sector is Health, Education, Government and Social Services: 17.6% of the TEA in Cyprus and 18.3% of the TEA in Europe are related to this sector. The strong professional services expertise in Cyprus is also reflected in early-stage entrepreneurial activity as 11.6% is related to this sector, whereas the corresponding rate in Europe is 9.7%. However, compared to Europe, TEA in Cyprus has lower involvement in other important sector of the economy such as Information and Communication Technologies and Manufacturing: indicatively, only 2.4% of TEA is pursued in the Information and Communication Technology sectors (cf. 5.5% in Europe). Similarly, for the Manufacturing sector, only 2.9% of Cyprus' TEA is involved (cf. 8.3% in Europe). These results are to a large extent aligned with the 2016/2017 GEM results, highlighting that the dominating sectors of the TEA activity in Cyprus are Wholesale and Retail, Health, Education, Government and Social Services and Professional Services. In fact, compared to last year, these sectors have seen a slight increase in the TEA involvement.

3.3. Nascent entrepreneurs

Nascent entrepreneurs are early-stage individuals currently active in planning a new venture. They have part-time or fulltime involvement in this activity and will have at least partial ownership of the new business. The new business in this case has not paid any wages or salaries for the past three months. In Cyprus, in 2016/2017, nascent entrepreneurs represented 7.6% of the population, whereas in 2017/2018 a notably lower rate of 3.6% was recorded. Nascent entrepreneurial activity mainly concerns activity that is at a concept-definition stage. Given the immature level and the young age (i.e. limited effort committed so far) of such endeavors, it could be concluded that it is more likely for nascent entrepreneurs to abandon entrepreneurial activity for more secure employment options. In Europe, nascent entrepreneurship rates remained relatively stable from 2016/2017 to 2017/2018 with the average European rate being higher than the one recorded for Cyprus in 2017/2018. Cyprus is ranked 13th in terms of its nascent entrepreneurial activity. The highest rates of nascent entrepreneurship are recorded in Estonia (13.4%), Latvia (9.4%) and Slovakia (8.2%). Concerning business ownership and nascent entrepreneurs in Cyprus, about one in two nascent entrepreneurs in Cyprus expects to have full ownership of the new venture (45.2%). while about one in five expects the new venture to have two or three owners (21.9%). Conversely, just 8.2% expect four owners and 2.7% expect five. This year's expectations of nascent entrepreneurs on ownership are relatively aligned with last year's results. Overall, in 2016/2017, about half of the nascent entrepreneurs expected to have full ownership of the new venture (49.7%), 25.5% expected the new business to have two owners, 18.8% expected three owners while 6% expected more than three owners. The motives of nascent entrepreneurial activity in Cyprus are more related to opportunity rather than necessity. In particular, 34.2% of nascent entrepreneurs are driven by the opportunity to increase income and 15.1% by the opportunity to reach greater independence. Despite the fact that a notable percentage of nascent entrepreneurs is driven solely by opportunity, 13.7% reported to be motivated by both opportunity and necessity.

Also, a notable amount of nascent entrepreneurs is driven solely by necessity as indicated by the reported 37% rate.

3.4. New business owners with significant growth potential

In addition to nascent entrepreneurs, TEA also accounts for new business owners. New business owners are early-stage entrepreneurs involved as owners and managers of new firms that have been set up and which are younger than 42 months old. The new ventures have paid some salaries or wages. In 2016/2017, 4.5% of the adult population in Cyprus were identified as new business owners, whereas in 2017/2018 a slightly lower rate (3.8%) is recorded. Both rates exceed the corresponding averages of new business owners in Europe - 3.4% in 2016/2017 and 3.1% in 2017/2018. Cyprus is ranked 6th among the GEM 2017/2018 European countries, in terms of new business owners. The highest new business owners' rates in Europe were recorded in Estonia (6.2%), The Netherlands (5.4%) and Latvia (5.1%). With regards to new businesses, 48.6% have one owner, 25.7% have two owners and 16.2% have three owners. A smaller amount of new businesses have more than three owners, as 2.7% of new businesses reported five owners,

1.4% reported seven owners, 1.4% reported eight owners, and 4.1% reported ten owners. These results are largely aligned with last year's results on new businesses owners, where 50% of the new business owners in Cyprus reported of having full ownership of their venture, 28.4% reported two owners, 14.8% reported three owners and 6.8% reported more than three owners. The entrepreneurial activity of about one in three (32.9%) new business owners is driven by the opportunity to increase income. The “desire to reach greater independence motive” drives 13.7% of new business owners. However, 24.7% new business owners are driven by mixed opportunity and necessity motives whereas 28.8% is solely driven by necessity, implying that about one third of the entrepreneurial activity among new business owners results from having no other alternative career option. In 2016/2017, the most important reasons contributing to the decision of business owners to start a new business, from an opportunity-driven perspective, are their desire to reach greater independence (27.9%) and increase in personal income (23.3%). Concerning both opportunity and necessity motives, 16.6% of new business owners reported mixed motives, whereas 34.5% associated their entrepreneurial activity solely to necessity motives. Compared to last year's results, in 2017/2018 the majority of opportunity-driven



new business owners is driven by the opportunity motive to increase income, rather than to reach greater independence. Also compared to last year, fewer new business owners associate their entrepreneurial activity only to necessity motives. These results are encouraging and indicate the potential of Cyprus' new businesses to sustain owners. Compared to last year, in 2017/2018 there has been a remarkable increase in the sole ownership of established businesses in Cyprus. The majority of established businesses in Cyprus is driven by opportunity rather than necessity motives. In particular, 26.8% of established businesses is driven by opportunity motives related to increase income, whereas 16.8% is driven by the opportunity motive to reach greater independence. Furthermore, 24.6% of established businesses is driven by both opportunity and necessity motives and 31.8% is driven only by necessity motives. In 2016/2017, most of the established business owners are motivated by positive reasons related to the desire to increase personal income (41.3 %) and the desire for

greater independence (33.7%). A further 9.4% was driven by mixed-motives whereas 36.9% of established business owners consider necessity as the only motive.

3.5. New business owners with significant growth potential

Alongside the exploration of business activity both early staged and mature, GEM also provides insights on business discontinuance. In 2017/2018, the rate of business discontinuance in Cyprus was 4.3%. This is higher than the corresponding European average rate (2.9%). While entrepreneurial activity is important for a country's economy, it is also complex and its discontinuance may be associated to different reasons. Table 1 outlines additional reasons for business discontinuance in Cyprus and in Europe. The most important reason leading to business discontinuance in both Cyprus and Europe is that businesses are not profitable. However, whereas the Cyprus rate stands at 39.8%, the respective European rate is notably lower (29.6%). A greaternumber of entrepreneurs in Cyprus had the opportunity to sell their businesses in 2017/2018 compared to 2016/2017. The rate of business discontinuance due to problems in getting finance has decreased compared to last year's results. Also, there is an increased rate of business discontinuance due to another job or business opportunity compared to last year. These insights support the view that overall, there is a continuous improvement in the financial conditions in Cyprus and signal that, compared to the previous year, there are more opportunities for businesses (e.g. selling the business or accessing finance) as well as for individuals (e.g. another job or business opportunity).

Table 1 Reasons for business discontinuance in Cyprus and Europe [Source: GEM Cyprus Report 2017/2018]

	 CYPRUS		 EUROPE	
	2016-2017	2017-2018	2016-2017	2017-2018
Opportunity to sell	1.3%	4.3%	4.7%	5.3%
Business not profitable	46.3%	33.7%	39.8%	29.6%
Problems getting finance	18.8%	10.7%	7%	12.2%
Another job or business opportunity	8.8%	12.3%	12%	11.2%
Exit was planned in advance	2.5%	5.9%	3.6%	5.3%
Family or personal reasons	16.3%	16.6%	22.9%	18.4%
Government/Tax Policy/Bureaucracy	6.3%	7.7%	0%	11.5%

4. Main Findings of the European Start-up Monitor 2016 for Cyprus in Brief

- 80% of start-ups are located in Nicosia and have an average age of 2.3 years (i.e., 28% were founded in 2016 and 27% in 2015); 41% are in the start-up stage and 28% in the growth stage; 17% are an online/ecommerce service, 18% a software or hardware technology and 12% a consumer or web application.
- 33% of start-ups had revenues between € 1 and € 25,000; 6% had revenues between € 5 and € 10 million. 88% responded positively on raising capital from private sources (i.e., savings of founders or contributions from family and friends) while 24% responded positively on raising capital through Business Angels.
- 74% of entrepreneurs would have found another start-up if their present start-up failed; 83% of responders indicated that there was a low probability for their current startup to close down. On average each start-up has 3 founders and are planning to hire 4 new employees, on average, during the next 12 months.

4.1. Entrepreneurial Impact

GEM considers that entrepreneurship has a different impact in each country. Economic entrepreneurial development and growth in each country is a mix of industry sectors, job creation, level of innovation and international orientation.

Industry

Both in Cyprus and Europe, the largest amount of TEA is recorded in the Wholesale and Retail sectors. In particular, in Cyprus, about one in two (45.4%) early-stage entrepreneurs relate their activity to the Wholesale and Retail sectors, whereas in Europe the corresponding average rate is 27%. The second most popular sector is Health, Education, Government and Social Services: 17.6% of the TEA in Cyprus and 18.3% of the TEA in Europe are related to this sector. The strong professional services expertise in Cyprus is also reflected in early-stage entrepreneurial activity as 11.6% is related to this sector, whereas the corresponding rate in Europe is 9.7%. However, compared to Europe, TEA in Cyprus has lower involvement in other important sectors of the economy such as Information and Communication Technologies and Manufacturing: indicatively, only 2.4% of TEA is pursued in the Information and Communication Technology sectors (cf. 5.5% in Europe). Similarly, for the Manufacturing sector, only 2.9% of Cyprus' TEA is involved (cf. 8.3% in Europe). These results are to a large extent aligned with the 2016/2017 GEM results, highlighting that the dominating sectors of the TEA activity in Cyprus are Wholesale and Retail, Health, Education, Government and Social Services and Professional Services. In fact, compared to last year, these sectors have seen a slight increase in the TEA involvement.

Job creation

A key priority of the European Union is to deliver growth with a strong emphasis on job creation and poverty reduction. Whether existing entrepreneurial activity has the potential to

create job opportunities is of great interest to policy maker and other stakeholders in the economy that are affected by dynamism in the job market. GEM questioned early-stage entrepreneurs about the number of employees (other than owners) they expect to have in the next five years or more. It is considered that the difference between existing and expected job positions is an indicator of the growth expectations of existing early-staged entrepreneurial activity.

In Cyprus, most of the early-stage entrepreneurs are not optimistic about new job openings. According to the 2017/2018 survey, 46.6% of early-stage entrepreneurs denoted that they are not expecting their entrepreneurial activity to create any jobs in the next five years. In 2016/2017, about one in three (31.2%) of the entrepreneurs in Cyprus expected that their entrepreneurial activity would create one to five jobs in the following five years and about one in five (20.9%) expected to create more than five jobs in the next five years. However, the results of the 2017/2018 survey show that about one in two entrepreneurs in Cyprus expects one to five new jobs in the next five years (a 14.3% increase compared to the previous year). However, in 2016/2017, 20.9% of the early-staged entrepreneurs in Cyprus expected six or more job openings in the following five years, whereas the corresponding rate in 2017/2018 has been reduced to 8%. The results show that early-staged entrepreneurs in Cyprus are becoming less optimistic about the expected growth of their entrepreneurial endeavors. As discussed earlier, the increased media attention has possibly assisted individuals (including entrepreneurs) in gaining a more realistic understanding of how entrepreneurial journeys unfold. The premature nature of early-stage entrepreneurial activity could be one of the reasons that most of the early-stage entrepreneurs do not expect new job creations in the next five years. Industrial sector could be another reason for the low rate of expected job creation projected in the next five years. Most of the TEA activity in Cyprus is relevant to the Wholesale and Retail sectors and thus this might restrict entrepreneurs in expanding their activity.

Other reasons that may deter entrepreneurs to remain small, could be the limited access to entrepreneurial finance or the use of sophisticated technology and communications that enable entrepreneurs to operate on their own. Additionally, early-stage entrepreneurs may choose to remain small also because of their desire to avoid complexities related to tax and legal requirements. It should be noted that these growth expectations are entrepreneurs' projections and given the preliminary stage of their entrepreneurial activity, those expectations express growth potential that has, as of yet, not been tested. Hence part of them could be unduly optimistic.

According to the second European Startup Monitor Report (2016), startups (involved in ESM) are job engines and create 12 jobs on average. The following figure presents the employment effect of start-ups (employees and founders). According to these indexes, Cyprus holds a medium employment effect (8,4 employees and 2,5 founders on average).

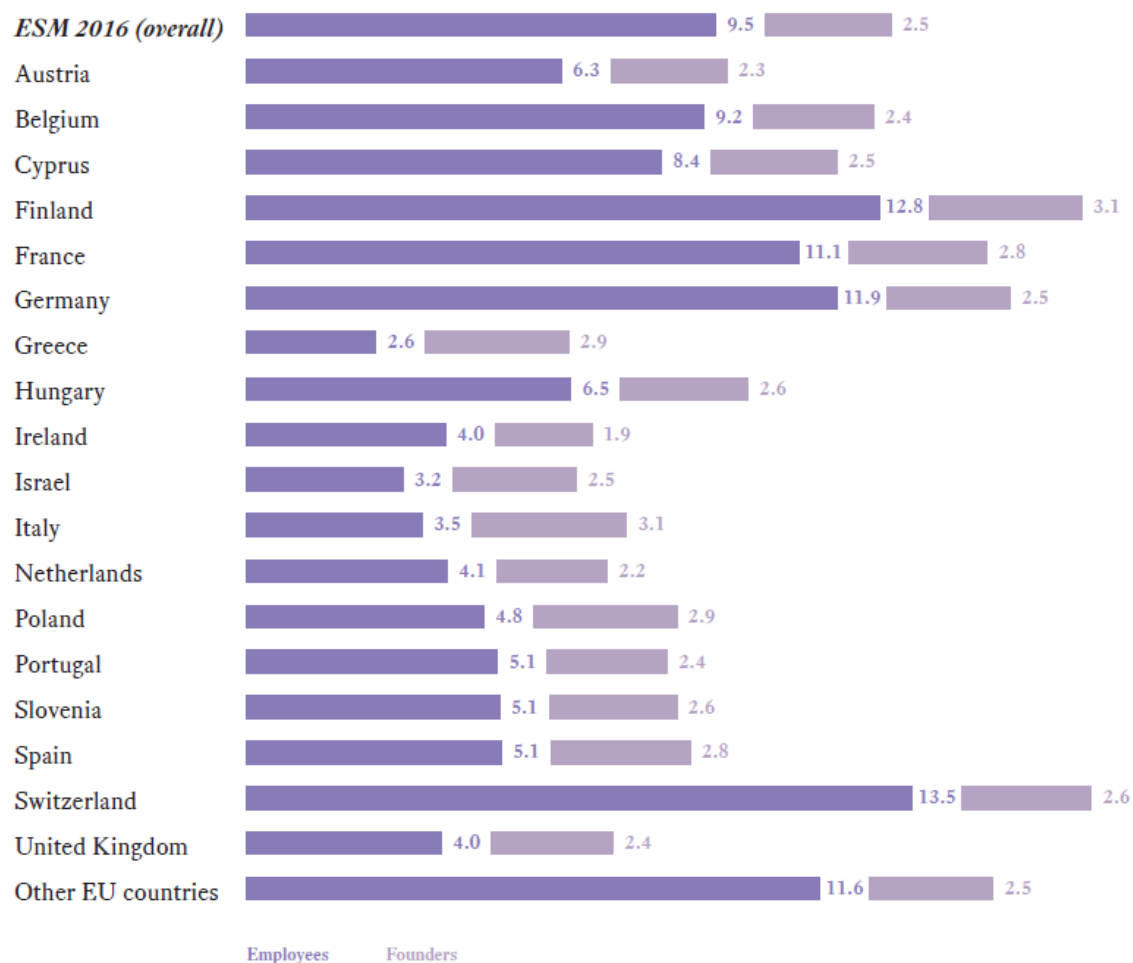


Figure 6 Average number of employees and founders [Source:ESM]

5. Entrepreneurship Ecosystem in Cyprus

Cyprus has a constantly evolving system of advanced and modern infrastructure, including sophisticated road, air and sea transport solutions and services. These include two multi-purpose deep sea ports located in Limassol and Larnaca, and two modern international airports located in Larnaca and Paphos. Good quality and affordable physical infrastructure contribute to the viability of new businesses. Cyprus’ good physical infrastructure is considered as one of the top strengths of its entrepreneurial ecosystem. National experts perceive that there is a high quality of physical infrastructure in Cyprus

such as roads, utilities, communications and waste disposal. Compared to last year, experts perceive that that such infrastructure has been improving (6.4 out of 9 in 2017/2018 compared to 5.9 out of 9 in 2016/2017). Concerning **physical infrastructure**, they perceive that new businesses are able to quickly gain good access to communications (telephone, internet, etc.; 7.2 out of 9 in 2017/2018) and good access to utilities (gas, water, electricity, sewer; 7.1 out of 9 in 2017/2018). The results also show that costs associated with communication services are considered as affordable for new or growing businesses (5.0 out of 9 in 2016/2017 and 5.8 in 2017/2018). Furthermore, these results indicate that communication services have become more affordable for new and growing firms in Cyprus since last year. Table below includes all the questions related to the Physical infrastructure and the corresponding rates as provided by national experts in Cyprus and in Europe.

Table 2 Physical Infrastructure [Source: GEM Cyprus Report 2017/2018]



	CYPRUS		EUROPE	
	2016-2017		2017-2018	
The physical infrastructure (roads, utilities, communications, water disposal) provides good support for new and growing firms.	5.9	6.2	6.4	6.0
It is not too expensive for a new or growing firm to get good access to communications (phone, Internet, etc.).	5.0	7.0	5.8	6.7
A new or growing firm can get good access to communications (telephone, internet, etc.) in about a week.	7.2	7.0	7.2	6.9
New and growing firms can afford the cost of basic utilities (gas, water, electricity, sewer).	5.3	6.6	6.0	6.6
New or growing firms can get good access to utilities (gas, water, electricity, sewer) in about a month.	7.1	6.7	7.1	6.8

(weighed average, scale: 1=completely false, 9=completely true)

Beyond the good physical infrastructure that is important for the execution of the activities of new enterprises, the **commercial and services infrastructure** can be considered as

equally important. Cyprus holds a very high quality commercial and services infrastructure and comprises of a plethora of highly-trained, experienced and multilingual professionals that offer high-quality legal, accounting, auditing, consulting and other types of services at competitive rates. There are more than 2,700 registered advocates (i.e. approximately one registered advocate per 300 citizens) and 160 limited liability law firms¹⁷. Alongside top international accounting firms that are established in Cyprus and provide accounting services, there are also more than 120 accounting firms operating locally. The strong financial and banking sector in Cyprus is aligned with legislation adopting international best practices and has a simplified, effective, stable and transparent tax system. National experts consider that new and growing firms can have easy access to high-quality professional, legal and accounting services (6.4 out of 9) as well as access to good banking services (5.9 out of 9). This reflects the capabilities of the highly-trained law, accounting and banking service professionals in Cyprus¹³. The high quality of human capital was also highlighted in the open-ended questions: “There is high-level of education across the youth. There is good quality of human capital in all sectors. The cost associated to human capital is low with respect to the quality human capital in Cyprus”. However, it was also noted that although there are sufficient subcontractors, suppliers and consultants to support new and growing firms (5.2 out of 9), subcontracting, supplying and consulting services are considered costly for new or growing firms (3.6 out of 9). Table below provides an overview of all the questions included in NES for measuring the commercial and services infrastructure condition.

Table 3 Commercial and services infrastructure [Source: GEM Cyprus Report 2017/2018]

Commercial and services infrastructure		 CYPRUS	 EUROPE	
There are enough subcontractors, suppliers, and consultants to support new and growing firms.	5.1	5.9	5.2	5.9
New and growing firms can afford the cost of using subcontractors, suppliers, and consultants.	3.5	4.0	3.6	4.1
It is easy for new and growing firms to get good subcontractors, suppliers, and consultants.	4.9	4.7	4.5	4.7
It is easy for new and growing firms to get good, professional legal and accounting services.	6.3	5.9	6.4	5.8
It is easy for new and growing firms to get good banking services (checking accounts, foreign exchange transactions, letters of credit, and the like).	5.7	5.8	5.9	5.8
	2016-2017		2017-2018	

(weighed average, scale: 1=completely false, 9=completely true)

Government policies may play an important role in shaping, enhancing and strengthening the entrepreneurial activity of a country. Cyprus offers an attractive, transparent and stable tax regime and one of the lowest corporate income tax rates in the European Union (12.5%) and hence it can be regarded as a reliable and affordable host for new businesses. National experts perceive that from a taxation perspective, government policies are supportive for new entrepreneurial endeavors. In particular, they perceive that the amount of taxes is not a burden for the new and growing firms (6.1 out of 9 in 2016/2017 and 6.5 out of 9 in 2017/2018) and taxes and other government regulations are applied to new and growing firms in a predictable

and consistent way (5.3 out of 9 in 2016/2017 and 6.6 out of 9 in 2017/2018). They also consider that the support for new and growing firms is a high priority for policy at the national government level (4.4 out of 9 in 2016/2017 and 4.9 out of 9 in 2017/2018). Overall, the perceptions of the national experts on government policies related to entrepreneurship have notably improved from 2016/2017 to 2017/2018.

Table below includes all the questions employed for measuring government policies condition. Despite the fact that perceptions of government policies have improved since last year, national experts perceive that a large proportion of the factors shaping this condition require notable improvement. For example, it is perceived that the support for new and growing firms should be considered as a higher priority for policy at local government level (3.4 out of 9 in 2016/2017 and 3.5 out of 9 in 2017/2018) and while government policies could become more supportive for new firms (3.4 out of 8 in 2016/2017 and 3.8 out of 9 in 2017/2018). The process for setting up a business in Cyprus, currently includes five procedures and requires approximately seven to twelve working days. However, experts consider that it is difficult for new and growing firms to deal with government bureaucracy, regulations, and licensing requirements (3.2 out of 9 in 2016/2017 and 4.2 out of 9 in 2017/2018). They also believe that in Cyprus, it is difficult to get most of the required permits and licenses in such a short space of time (i.e. about a week) (1.9 out of 9 in 2016/2017 and 2.1 in 2017/2018).

Table 4 Government policies[Source: GEM Cyprus Report 2017/2018]

Government policies	CYPRUS		EUROPE	
	2016-2017	2017-2018	2016-2017	2017-2018
Government policies (e.g., public procurement) consistently favor new firms.	3.4	3.1	3.8	3.4
The support for new and growing firms is a high priority for policy at the national government level.	4.4	4.5	4.9	4.7
The support for new and growing firms is a high priority for policy at the local government level.	3.4	4.3	3.5	4.5
New firms can get most of the required permits and licenses in about a week.	1.9	3.6	2.1	3.5
The amount of taxes is NOT a burden for new and growing firms.	6.1	4.0	6.5	4.1
Taxes and other government regulations are applied to new and growing firms in a predictable and consistent way.	5.3	4.4	6.6	4.5
Coping with government bureaucracy, regulations, and licensing requirements is not unduly difficult for new and growing firms.	3.2	3.9	4.2	3.9

(weighed average, scale: 1=completely false, 9=completely true)

5.1. Entrepreneurial education and training

According to Eurostat, Cyprus holds a highly educated human capital compared to the rest of the countries in the European Union (EU). In particular, it is ranked third in the EU in terms of proportion of the population with tertiary education with regards to the 30 to 34 age group. The government has formulated several policies that regard the enhancement of

education from an entrepreneurial perspective. For example, the Ministry of Education promotes entrepreneurial activities and competition at school and university levels to raise awareness on entrepreneurship, build creativity, critical thinking and other related skills and competencies to students of all ages (e.g. “Digital Entrepreneurship Competition”, “Student Enterprise”, “Spending Smart” etc.). However, national experts stress the need to further improve entrepreneurial education. Reflecting on primary and secondary education in Cyprus, they consider that it does not include activities or courses that encourage creativity, self-sufficiency and personal initiative (3.0 out of 9 in 2016/2017, 3.2 out of 9 in 2017/2018), it does not provide adequate instruction in market economic principles (3.0 out of 9 in 2016/2017 and 3.4 out of 9 in 2017/2018), nor does it provide adequate attention to entrepreneurship and new firm creation (2.0 out of 9 in 2016/2017 and 2.8 out of 9 in 2017/2018). Similarly, experts perceive that postschool entrepreneurial education is limited. In particular, they stress that at post-school level, there is limited business and management education (5.5 out of 9 in 2016/2017, 5 out of 9 in 2017/2018) and limited vocational, professional and continuing education (5.0 out of 9 in 2016/2017 and 3.9 out of 9 in 2017/2018). Likewise, they perceive that universities provide limited preparation to individuals for proceeding with entrepreneurial endeavors and growing new firms after their studies. Although experts’ perceptions towards entrepreneurial education at school level have improved compared to last year’s results, their perceptions towards entrepreneurial post-school education remained stable or have decreased. Overall, it could be concluded that primary and secondary education in Cyprus provides limited orientation towards entrepreneurship and places limited emphasis on the development of the skills necessary for proceeding with entrepreneurial endeavors. As one of the experts noted, there is an “education gap – lack of education on entrepreneurship from early ages. Children need to be channeled towards creativeness-innovation-entrepreneurship- creation from early stages - away from the safety of an employee salary”.

5.2. Government entrepreneurship programs



According to the Ministry of Energy, Commerce, Industry and Tourism, a “One-Stop Shop” service has recently been set up in order to assist the acceleration and simplification of the process required for setting up a business. However, experts consider that government assistance for new and growing firms which can be obtained through contact with a single agency, is limited (2.8 out of 9 in 2016/2017 and 2.9 out of 9 in 2017/2018). This is supported by the views of the open-ended questions stressing delays in reducing “bureaucracy related to the registration of new businesses” and in achieving “wide deployment of e-government services”. Similarly, it is viewed that the support provided to new and growing firms by science parks and business incubators is also limited (3.1 out of 9 in 2016/2017 and 3.2 out of 9 in 2017/2018). According to the national experts, there is a restricted number of government programs for new and growing businesses (3.9 out of 9 in 2016/2017 and 3.8 out of 9 in 2017/2018). Therefore, the need for government programs to support new business especially at early stages is highlighted: “The government must adopt urgently measures towards supporting startups at their early stages, at the time they mostly need help, but nobody dares to help them”. Concerning the help and assistance provided by government programs to new and growing businesses to find what they need, national experts view that the assistance available is limited (3.1 out of 9 in 2016/2017 and 3.2 out of 9 in

2017/2018). They also stress that the human capital of government agencies cannot sufficiently support new and growing firms in an effective manner (3.2 out of 9 in 2016/2017 and 3.5 out of 9 in 2017/2018). According to the views of the national experts, civil servants lack the necessary skills as they often do not have previous experience in the private sector: “Lack of civil servants who have worked and were competitive in the private sector”.

5.3. Access to finance

Table below presents a comparison ranking between Europe average and Cyprus (for 2016/2017 and 2017/2018 GEM Reporting periods), regarding access to finance for the development of new firms. According to the results of the NES 2017/2018, access to finance is the second most important obstacle for entrepreneurial activity in Cyprus.

Table 5 Access to finance in Cyprus [Source: GEM Cyprus Report 2017/2018]

Access to finance	 CYPRUS		 EUROPE	
	2016-2017	2017-2018	2016-2017	2017-2018
There is sufficient equity funding available for new and growing firms.	3.3	4.6	3.4	4.6
There is sufficient debt funding available for new and growing firms.	3.5	4.7	3.7	4.9
There is sufficient government subsidies available for new and growing firms.	4.8	5.0	4.3	5.1
There is sufficient funding available from informal investors (family, friends and colleagues) who are private individuals (other than founders) for new and growing firms.	4.4	4.8	5.0	4.9
There is sufficient professional Business Angels funding available for new and growing firms.	4.0	4.5	4.2	4.6
There is sufficient venture capitalist funding available for new and growing firms.	2.3	4.5	2.5	4.5
There is sufficient funding available through initial public offerings (IPOs) for new and growing firms.	2.3	3.5	2.4	3.5
There is sufficient private lenders' funding (crowdfunding) available for new and growing firms.	2.1	4.3	2.7	4.5

(weighed average, scale: 1=completely false, 9=completely true)

5.4. Eco-Innovation in Cyprus

Despite significant improvement, Cyprus continues to perform poorly in eco-innovation. In 2017, the country scored only 45 (EU average = 100). This places the country just second last in the EU28 ranking of eco-innovative countries. Cyprus is heavily behind the EU28 average in eco-innovation inputs and activities, socio-economic outputs and resource efficiency outcomes. It performs above the EU28 average in Eco-innovation outputs.

Eco-innovation in Cyprus is predominantly produced by individual actors – research institutes or enterprises. As such, there are no distinct and mature eco-innovation sectors. Given the country’s rich natural capital and inaccessibility to the energy grid of other countries, new developments in renewable energies could also promote eco-innovation activities. Eco-innovation in the field of energy is also driven by efforts to increase energy efficiency. The agricultural and food industries are also contributing to eco-innovative solutions. Additionally, a number of EC funded research and innovation projects in the field of eco-innovation are currently under implementation.

In terms of eco-innovation drivers, there is a wide range of EC supported funding opportunities for R&D that include eco-innovations. With a total budget of approximately EUR 100 million, the programme RESTART acts as a significant support of research. The country also provides numerous tools to enhance access to information that is vital to increase innovation and growth.

Regarding barriers, the R&D sector in the country is relatively new as it dates from the mid-90s. As such, the system is still fragmented with a lack of coordination between the different stakeholders. The governance of research is lacking whereas the interface between research and business is inadequate. In addition, there is an inadequate evaluation culture to monitor research and increase its effectiveness.

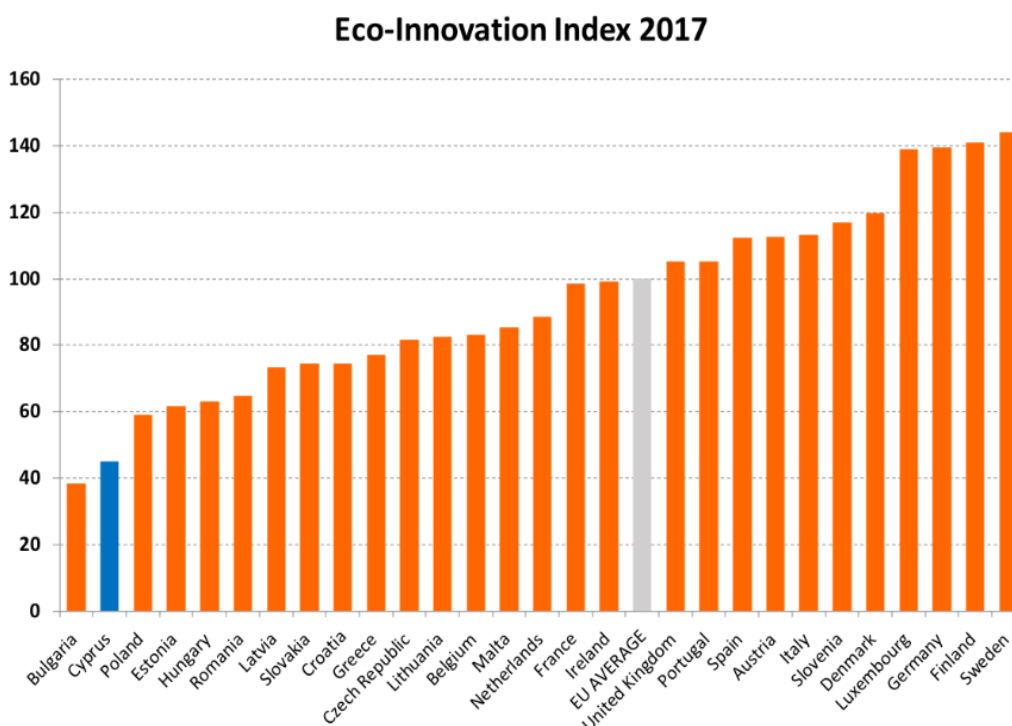


Figure 7 Eco-Innovation Scoreboard ranking in EU [Source: European Commission]

Figure below shows the performance of Cyprus in each of the five components of the Eco-IS composite index. Cyprus significantly lags behind the EU28 average in eco-innovation inputs and activities and socio-economic outputs. It performs close to the EU28 average in resource efficiency outcomes and above the EU28 average in Eco-innovation outputs. The paragraphs below analyses the performance of Cyprus for each of the five indicators [Source: EIO, 2017].

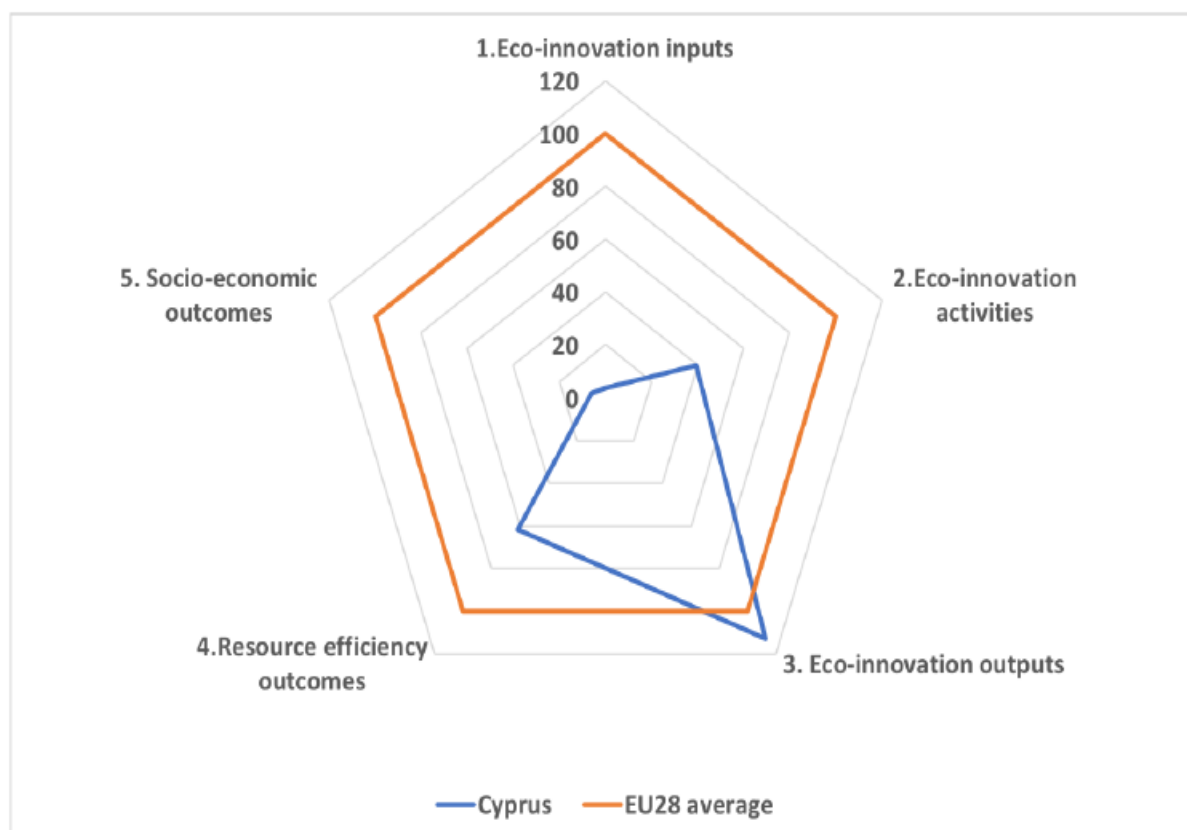


Figure 8 Components of the eco-innovation composite index for Cyprus, 2017 [Source: EIO, 2017]

Eco-innovation inputs

The eco-innovation input index is based on the national indicators of the government's environmental and energy R&D appropriations and outlays, R&D personnel, and cleantech investment. Cyprus ranks last with a score of 4 (EU average index 100). The score indicates no significant improvement in the performance compared to the 2015 assessments, when the score of Cyprus was 2. In 2014, total government environmental and energy R&D appropriations and outlays amounted to 0.0024% of GDP with an EU average of 0.037% (0.0025% in 2014). The total R&D personnel and researchers for Cyprus in 2016 counted for 0.36% of total employment (EU average of 1.32%) and dropped by approximately 0.01% compared to 2014. No early stage green investments were reported during the period 2014-2017.

Eco-innovation activities

The eco-innovation activities index of the Eco-IS is based on the statistics of ISO 14001 certified companies and of enterprises that introduced an innovation with environmental benefits obtained within the enterprise or by end-users. Cyprus scores below the EU28 average (7th from the bottom). According to Eco-IS, in 2014, the percentage of firms that introduced an innovation with environmental benefits obtained within the enterprise was 0.14% of all firms (EU average 0.22%). The percentage for of firms that introduced an innovation with environmental benefits obtained by end users was 0.08% of all firms (EU average 0.14%). Finally, in 2014, the number of ISO 14001 certified organisations in Cyprus in 2016 was 68 (55 in 2014) translating into 80 registered organisations per million of inhabitants (64 in 2014).

Eco-innovation output

Cyprus scores above the EU average on eco-innovation output. In 2014, only 2 eco-innovation related patents were reported, whereas 1 patent was reported in 2012. The poor performance reflects the relatively limited available resources and the difficulty of translating research into technological innovation. Cyprus is a very good performer in eco-innovation relation publications, with a significant increase from 38.46 publications per million inhabitants in 2014 to 45.97 in 2016. This performance is considerably higher than the EU average (20.53). When also taking into account the remarkable improvement from 2014, it can be concluded that there is an increasing interest on eco-innovation by the academic/research community. As regards to eco-innovation related media coverage (measured as the number of hits, the performance of Cyprus slightly declined compared to the 2015 assessment and scored above the EU average. Specifically, Cyprus score in 2017 was 0.37 (EU index 0.35).

Resource efficiency outcomes

The resource efficiency outcome index is based on combined national statistics on domestic material productivity, domestic water productivity, inland energy productivity, and GHG emissions intensity. Cyprus is positioned below the EU28 average with an overall score of 62 (EU index 100), showing a significant decrease from 77 in 2013. The country performance in this index is impacted by the relatively high consumption of fossil fuels (hence increased GHG emissions), used among others, for the production of electricity. In 2015, material productivity (GDP/DMC) reached 1.75 €/kg (1.45 €/kg in 2013) when the EU average was 2.31 Euro/kg. In comparison in Malta material productivity in 2015 was 2.02 €/kg (2.25 €/kg in 2013), in Estonia 0.78 Euro/kg (0.62 Euro/kg in 2013) and Latvia 0.84 €/kg (0.83 €/kg in 2011). The latter indicates an improvement in countries with low population except of Estonia and Cyprus. Water productivity, measured as GDP generated by domestic water consumption, was 96 €/m³ in 2011, equal. Cyprus' water footprint in the same year was approximately 221 m³ per year. In the energy productivity of 2015 (GDP generated by domestic energy use. The country's productivity reached 9.12 €/ton (from 8.72 €/ton of oil equivalent in 2013). Finally, GHG emissions intensity in 2015 (amounts of GHG emissions generated per unit of GDP) was at 0.46 kg of CO₂ equivalent/GDP (from 0.42 kg of CO₂ equivalent/GDP in 2013), significantly above the EU28 average for the same year (0.30kgCO₂ e/€).

Socio-economic outcomes

In 2017, Cyprus' performance in socio-economic outcomes continued to be the weakest in the EU but with a slight improvement compared to 2015. Specifically, with an EU index of 100, the country's score was 6 (0 in 2015). Notably in 2011, the country was above the EU average with a score of 120. This fluctuation is mostly the result of erosion in eco-innovation exports (which were possibly partially counterbalanced by the increased share of high- and medium-high-tech products to the trade balance) and a reduction in the people employed in the eco-innovation sector as a result of the overall impact of the economic crisis. In 2016, eco-industry exports declined to 0.03% of all exports (from 0.12% in 2014). Employment in eco-industries increased in 2016 to 0.6% from 0.12% of total employment across all companies in 2014.

6. SMecoMP project

Small and medium-sized enterprises (SMEs) in the Balkan Med area face strong challenges, especially in the areas of innovation, entrepreneurship and environmental protection and investment in innovative and/or "green" products or services is very small. Furthermore, the recent economic crisis increased unemployment and created the biggest brain drain in the region in modern times, depriving SMEs and Higher Education Institutes (HEI) from young, talented, and well educated personnel. The SMecoMP project addresses both challenges by developing a strong and resilient knowledge alliance among HEIs, vocational education training (VET) centers and SMEs, to promote eco-entrepreneurship, -management and –innovation. The overall objective is to promote eco-management and –innovation among existing SMEs and support young entrepreneurs in entering in the "green" and/or "blue" economy, creating new added value jobs, improving the area's competitiveness, ameliorating the brain drain phenomenon, contributing thus to the area's sustainable development.

Small and medium-sized enterprises (SMEs) dominate economic activity in all countries among the project partners. Despite their, substantially above EU average, contribution to their economies, SMEs in face strong challenges, especially in the areas of entrepreneurship and environment, which are exacerbated by the continuing economic crisis. Despite recent efforts to ease the process of starting and closing a company, there are still significant problems in promoting the set up of innovative, growth producing SMEs. Although countries in the area have some of the highest proportions of micro-enterprises in the EU, these are mostly small business focused primarily on producing current family income instead of boosting innovation and generating growth. Furthermore, only a small proportion of SMEs are investing in resource-efficiency measures or produce ‘green’ products/services. There are still vast opportunities, shared by all countries, in both managing environmental resources and natural beauty areas and introducing environmental issues in managing SMEs. Another common challenge is the brain drain phenomenon, which though could also be viewed as an asset for SMEs since they can capitalize on young people with good education high motivation and excellent talent. The SMecoMP project addresses the above common challenges and exploits the use of common assets, by creating a network of academic institutions and businesses’ umbrella organizations in the programme area that will develop an educational framework to create and support eco-entrepreneurship and the appropriate eco-management tools and skills for businesses’ staff and managers. The project’s approach relies mainly in developing a business-university collaboration across countries in the programme area to promote eco-entrepreneurship, management and innovation. Universities are an integral part of the “skills and innovation supply chain” to business. However, for this supply chain to be of high quality, strong, resilient and close collaboration, partnership and understanding between business and universities is required. These are the foundations upon which the SMecoMP Transnational Network will be developed in order to address the two main common challenges identified above, inadequate entrepreneurship education and environmental and resource management knowledge and skills. Through collaboration, the SMecoMP will develop a comprehensive framework of training curricula that include courses, coaching and mentoring tools, seminars, workshops, impromptu think tanks and motivational videos, provided through classroom or electronic environments. Although none of these tools is innovative on its own, the combination of all of them, their tailor-made learning modules on eco-entrepreneurship and management and their focus on SMEs,

definitely covers an existing gap in the programme area. SMecoMP will teach, mentor and coach green entrepreneurs that will produce/offer a product, service, or process that benefits the environment. Promoting the participation of the area’s SMEs in the “green economy” and, in the same time, exploring cooperation opportunities, will improve the area’s competitiveness.

The SMecoMP project aims at establishing a strong and resilient knowledge alliance among Higher Education Institutes (HEIs), vocational education training (VET) centers and SMEs, in the programme area, to promote eco-entrepreneurship, -management and -innovation by developing an educational framework based on solid research and the exchange of experiences and best practices and using innovative education and training tools and methods. The overall objective is to improve quality of education and enhance SMEs' competitiveness in the programme area.

In this regard, the project has set the following specific objectives:

- report the existing and assess the required by SMEs in the programme area eco-entrepreneurship, -management and -innovation knowledge and skills,
- review the available and develop new formal and non-formal educational training processes and other initiatives,
- develop an innovative learning framework, by collaboration of the strategic partners (HEIs, VET centers and SMEs), to support education modernization and SMEs' staff lifelong learning,
- develop a learning-outcomes-based curricula jointly by the HEIs and VET centers and the labor market actors based on the identified SMEs professionals' cognitive and training needs,
- develop and deliver tailor-made training modules adapted to eco-innovation entrepreneurial knowledge and skills required by SMEs staff,
- increase professionals and SMEs' awareness on eco-innovation and sustainable economy practices,
- establish an active transnational network of academics, vocational trainers, researchers, mentors, professionals, spin off staff and new business entities to foster the integration of education, research and business,
- provide a self-sustaining implementation strategy to support the recognition and transfer of SMecoMP approach outside the Balkan Med area.

The SMecoMP's main outputs are:

- SMecoMP Transnational Network of academics, SME's staff and other stakeholders, that strengthens their collaboration and improves their capacities,
- development of a learning-outcomes based curricula and 4 training modules, focusing on Eco-Innovation and Entrepreneurship (EIE) knowledge and skills, catering to the needs of SMEs' staff and young entrepreneurs,
- establishment of the SMecoMP pre-Incubator program for individual entrepreneurs to receive training, coaching and mentoring,

- customization of an ICT training platform to deliver blended learning courses on EIE.

HEIs' participation in SMecoMP will improve their understanding of actual markets' needs and thus their curricula and enhance cooperation with businesses. SMEs will benefit from receiving training for their staff in sustainable practices, improving economic performance and competitiveness. SMEs' staff will improve their skills and competences, enhancing their performance at current occupation and also their employment opportunities. Young entrepreneurs will be supported to develop their ideas by receiving services such as management training, mentoring, coaching and networking connections.

SMecoMP contributes to Balkan Med programme's priorities: Innovation and Entrepreneurship and Environment.

The project's results are:

- i) The SMecoMP Transnational Network will become a focal point in the program area promoting and supporting sustainable practices of existing SMEs and fostering eco-innovation entrepreneurship, improving SMEs' competitiveness. The alliance will play a strong role in disseminating sustainable practices, setting up the basis for further and more focused cooperation schemes in the future. The SMecoMP's European character is supported by the participation of the Club NE, member of the European Confederation of Young Entrepreneurs.
- ii) Enhancement of SMEs owners and staff awareness and knowledge on eco-innovation and sustainable practices resulting in economic benefits for the business and the region but also in social benefits through minimization of environmental impacts enhanced efficiency of natural resource use and climate change resilience of the region.
- iii) Improvement of existing SMEs' competitiveness and support of the establishment of new spin-off companies, contributing to the creation of new and high added value jobs and thus, ameliorating the brain drain phenomena in the program area.
- iv) Development of an infrastructure (learning-outcomes-based curricula and training modules delivered through innovative ICT tools) that supports and enhances enterprise development and eco-entrepreneurship.
- v) Improvement in higher education practices, by embedding practical knowledge and entrepreneurship across the University curricula.
- vi) Improvement in lifelong learning processes, by equipping students, graduates and professionals with an enhanced capacity to generate ideas, the skills to realise these ideas and the knowledge and capabilities required to apply these abilities in the context of setting up a new venture or business.

SMecoMP results will not create economic advantages for the participating partners over

their competitors.

6.1.SMEcoMP Survey key findings

The survey on Eco-innovation and entrepreneurial Training Needs and Existing Educational Initiatives was answered by a total number of 38 enterprises in Cyprus. The majority of them, 21 in number (55%), are small enterprises which employ up to 50 people, whereas 8 enterprises (21%) employ between 50-250 people and 9 enterprises (24%) employ more than 250 people (Figure 9).

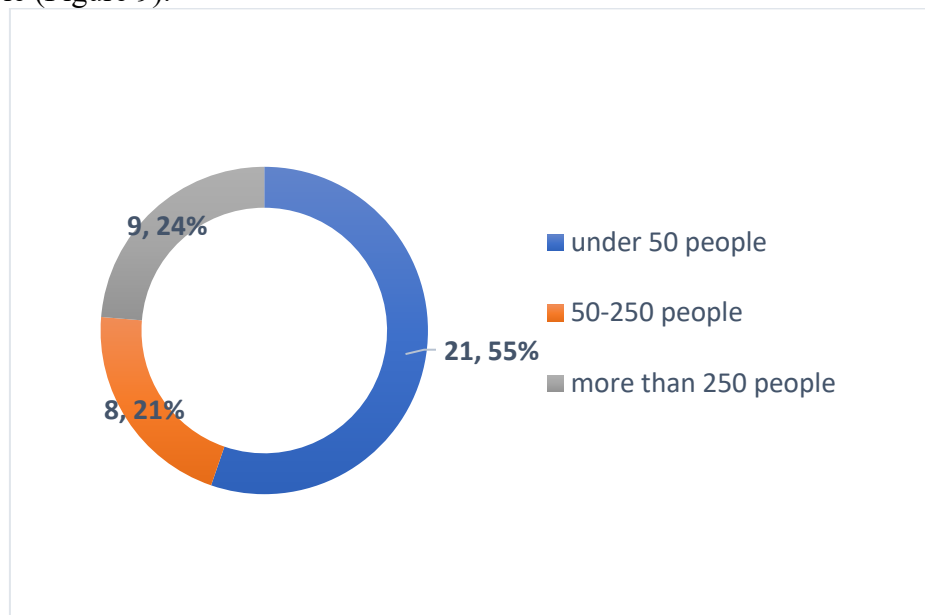


Figure 9 Number of employees

As shown in Figure below the enterprises that participated in the survey come from the following sections of economic activities, based on the NACE classification. The majority of them (24%) are from the “Professional, scientific and technical activities” section. Sixteen (16%) of them are from the “Construction” and “Other services” sections.

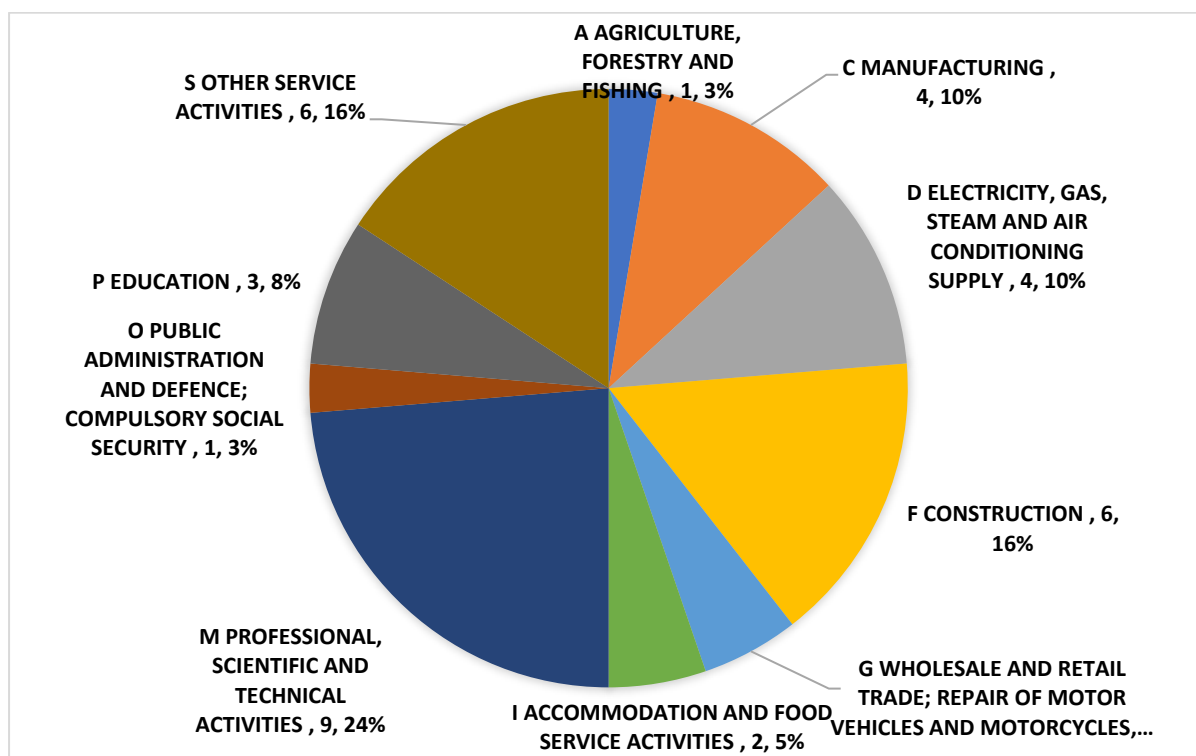


Figure 10 Main economic activity of the enterprises

The survey on Eco-innovation and entrepreneurial Training Needs and Existing Educational Initiatives was answered by a total number of 38 enterprises in Cyprus. The majority of them, 21 in number (55%), are small enterprises which employ up to 50 people, whereas 8 enterprises (21%) employ between 50-250 people and 9 enterprises (24%) employ more than 250 people. A lack of high-quality eco-innovation educational trainings has been identifying according the answers of the participants. Regarding the sufficiency of the number of training seminars offered on eco-innovation in Cyprus, 58% of the participants answered that is not sufficient, 37% that they don't know and only 5% that is sufficient.

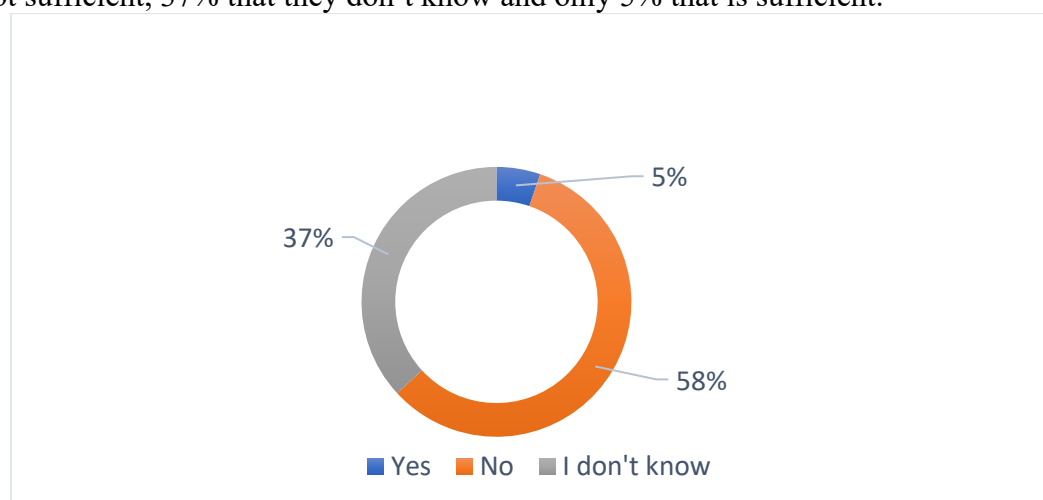


Figure 11 Do you think that the number of training seminars offered on eco-innovation in Cyprus is sufficient?

Also, 68% of the respondents answered that they didn't have access to high high-quality, affordable, relevant training seminars on eco-innovation in Cyprus.

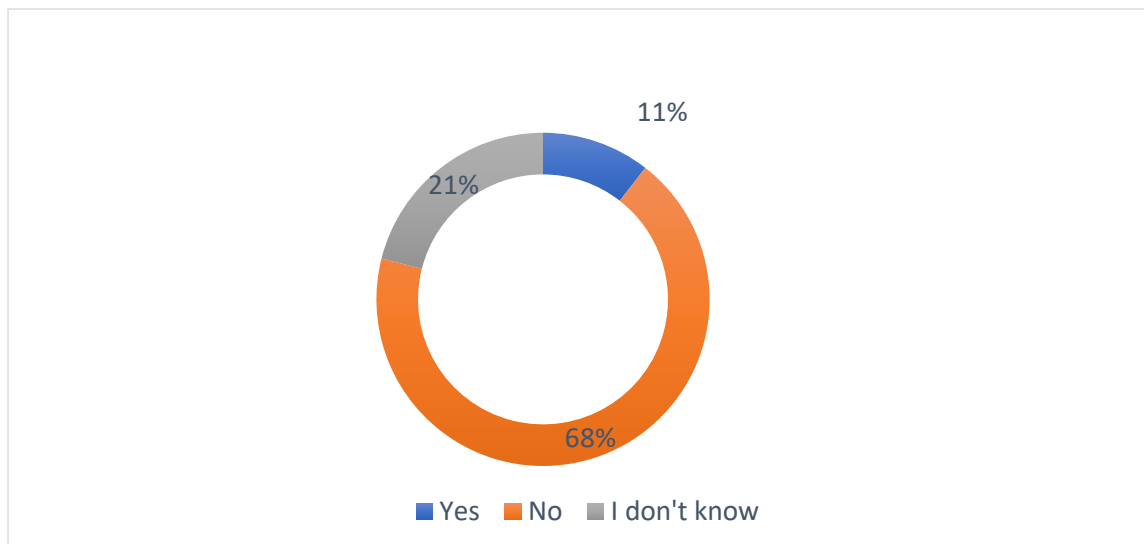


Figure 12 Do you believe you have had access to high-quality, affordable, relevant training seminars on eco-innovation in Cyprus?

Moreover, this survey highlighted the great interest regarding several eco-innovation fields (Figure 13).

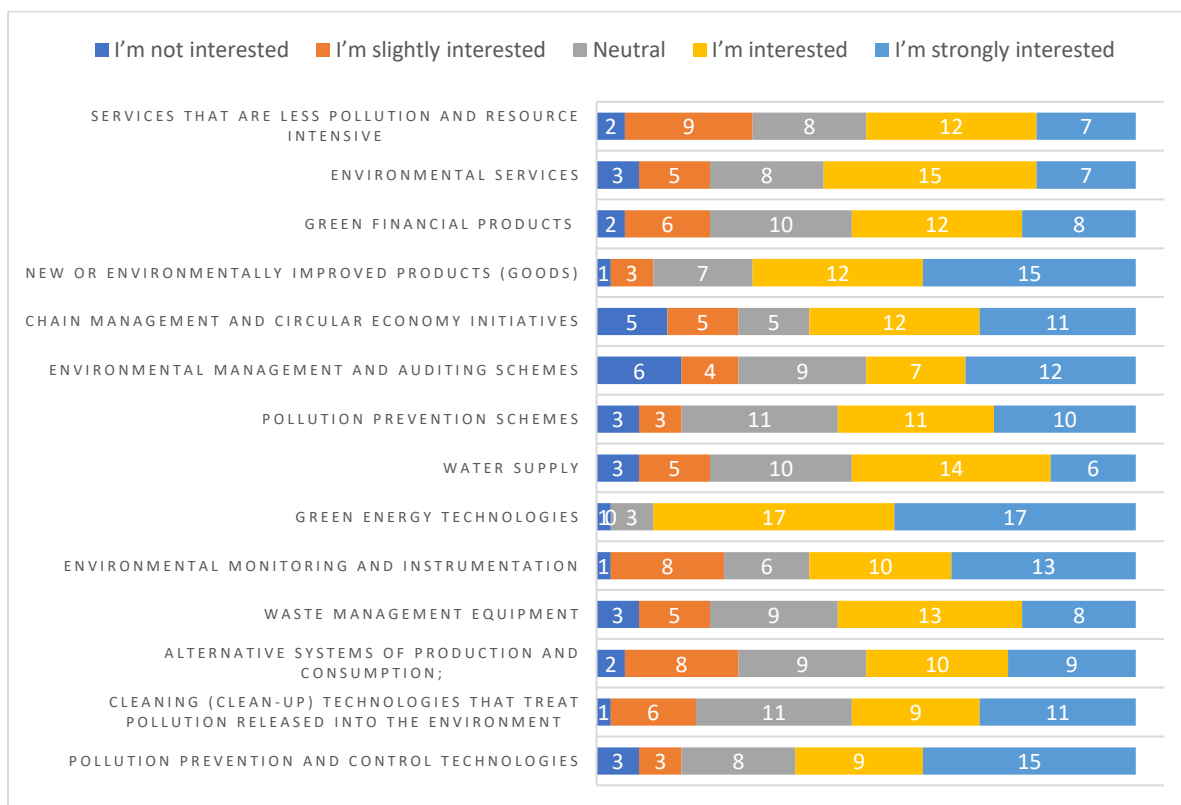


Figure 13 Level of interest in participating in training activities on eco-innovation

Enterprises were asked to evaluate the importance of certain competences that a company’s employees must have in order to succeed in pursuing eco-innovation. All responders value highly the importance of the following competences, as shown in Figure 14.

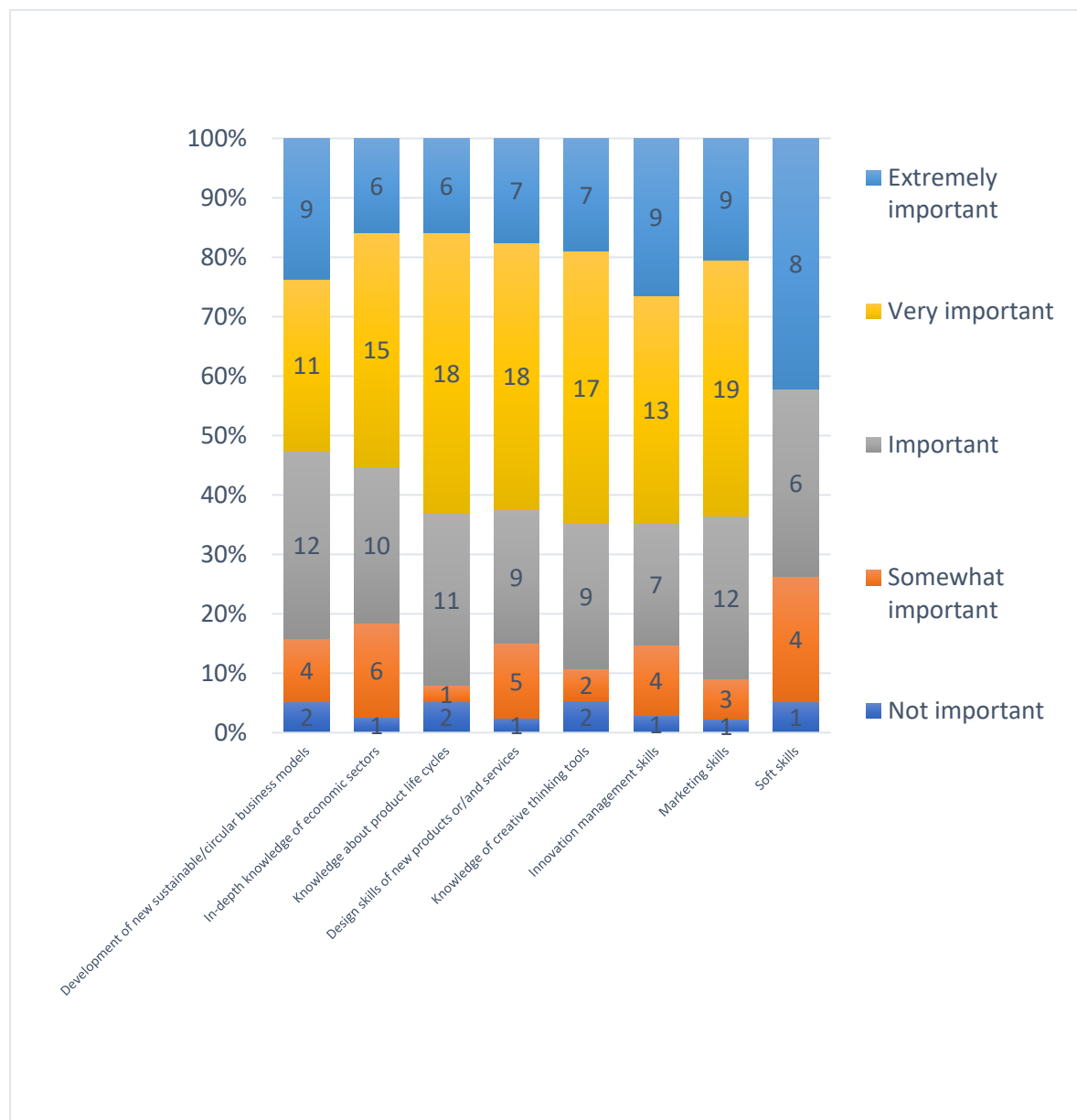


Figure 14 Importance of competences in order for a company to succeed in pursuing eco-innovation

The majority of the respondents (53%) stated that their company and employees possess these competences, 34% answered that they don’t and 13% that they don’t know (Figure 15).

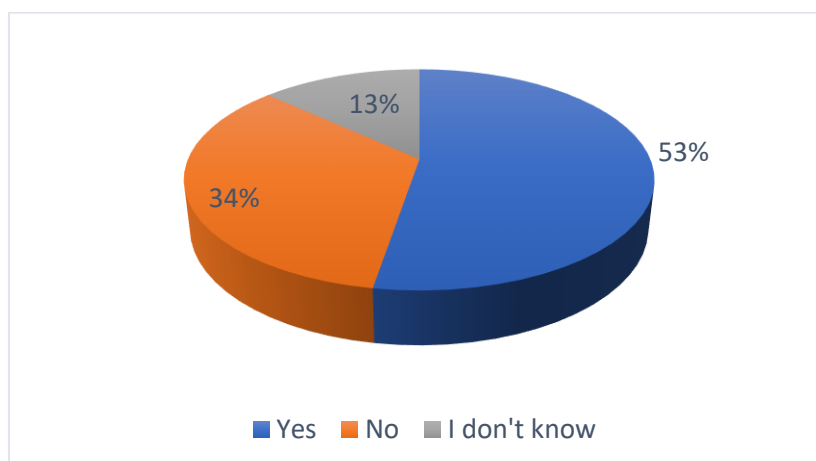


Figure 15 *Do you believe that your company and its employees have such competences?*

The majority of the respondents (92%) would encourage their colleagues to participate to eco-innovation training initiatives and out of them, 66% would prefer the training activities to take place in blended learning environment, 29% prefer the training activities to be in classroom learning environment and 5% stated that they prefer the training activities to take place in online learning environment (Figure 16).

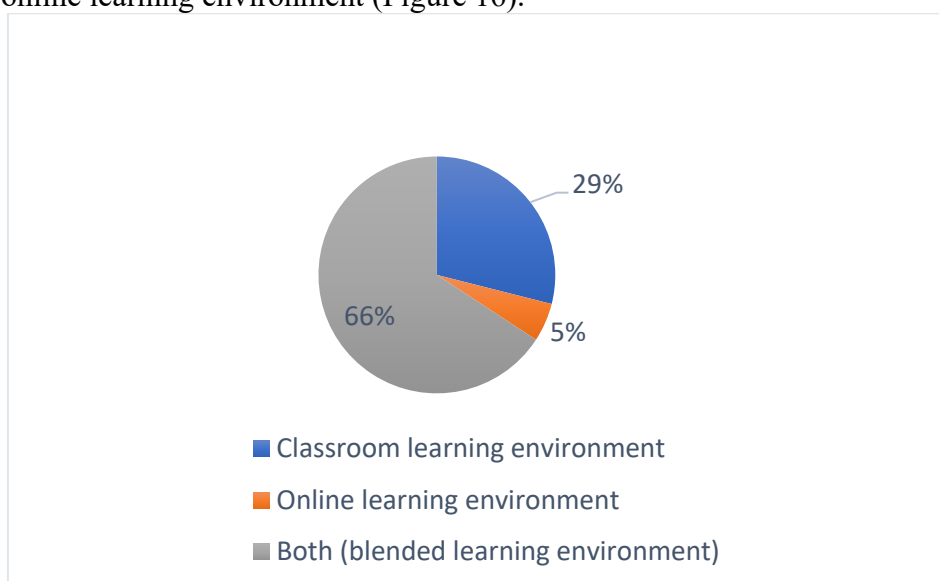


Figure 16 *Preferred methods for training activities on eco-innovation*

To an answer whether they would appreciate uninterrupted access of their company to a continuous informative streamline on the advances in best practices and eco-innovations in their industry field, 92% of the respondents answered positively, 3% that they wouldn't and 5% that they don't know (Figure 17).

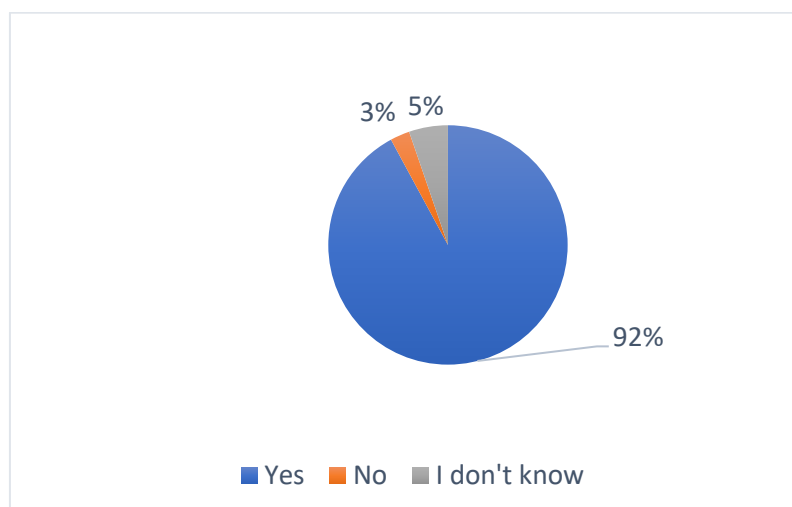


Figure 17 Would you appreciate uninterrupted access of your company to a continuous informative streamline on the advances in best practices and eco-innovations in your industry field?

Consequently, in Cyprus the acceleration of eco-innovation training courses is a necessity as there is a great potential and willingness for implementing eco-innovation, even if currently the amount and quality of the offered eco-innovation training courses are not sufficient.

7. Eco-innovation drivers and barriers in Cyprus

Eco-innovation in Cyprus is predominantly produced by individual actors – research institutes or enterprises. As such, there are no distinct and fully developed eco-innovation sectors. Cyprus is not interconnected with other countries for the supply of energy, although the feasibility of a subsea electricity cable is being investigated (JRC, 2017). When also considering the rich natural capital in the country, new developments in **renewable energies** could further promote eco-innovation activities. In Cyprus, electricity from renewable sources is mostly promoted through a combination of a subsidy scheme, premium tariff as well as a net metering scheme. The country aims to increase the contribution of renewable energy sources (RES) to 13 % of the total energy consumption by 2020. In 2016, the share reached 9.3% compared to 6% in 2011 (JRC, 2017). The country performs well in the use and construction of solar water heating systems; 92% of households are equipped with solar water heaters and 53% of hotels have installed large solar water heating systems. Eco-innovation in the field of energy is also driven by efforts to increase energy efficiency. Under the 2014-2020 cohesion policy, the country is investing more than 45 million EUR in energy efficiency improvements in residential and public buildings and SMEs (European Commission, 2017). The country will also focus on the development of efficient cogeneration and district heating installations.

A number of **EC funded research and innovation projects in the field of eco-innovation** are currently under implementation. In particular, the Life+ instrument supports a total of 6 ongoing projects, which cover issues such as:

- waste management (developing policy tools for recycling in islands and demonstration of an integrated waste-to-energy system for energy generation from biodegradable organic waste and wastewater).
- industrial waste (the demonstration of an environmentally and financially sustainable procedure for the management and treatment of returned, expired dairy products).
- Biodiversity (establishment of plant reserves, protection of Natura 2000 sites and awareness raising).
- Resource efficiency (Quarry resource efficiency demonstration project)

The RESTART 2016-2020 Programme is a multiannual development framework of Programmes for the support of Research, Technological Development and Innovation (RTDI) in Cyprus. RESTART plays a significant role in innovation as it supports research on several areas (Research Promotion Foundation, 2016). Energy is considered as one of the dominant priority sectors, together with tourism. The areas of sustainable growth and environment are treated as important horizontal sectors.

By 2016 Cyprus received 0.2% of the EU H2020 contribution (European Commission, 2017). As of September 2017, the amount of EUR 4.2 million was awarded to Cypriot organizations in projects addressing amongst others energy (e.g. the projects ZERO-PLUS (net zero energy settlements) and GOFLEX (smart grids)).

The **agricultural and food industries** are also contributing to eco-innovative solutions: waste treatment in olive oil production; compost produced from recycled plants (such as lawn, garden clippings, tree leaves, vine leaves etc.); biological waste treatment (that turns biodegradable waste into either high-quality compost or Solid Recovered Fuel); advanced glasshouse for producing exotic flowers; organic and energy efficient production of wine and olive oil etc. (EIO, 2016).

7.1.Greening Cyprus Beaches

The Cyprus Tourism Organisation, the Travel Foundation UK and the Cyprus Sustainable Tourism Initiative launched the programme as an effort to promote sustainable tourism in the country. Among others, the programme promotes a sustainable approach in the exploitation of coastal areas. Educational programmes are organised to educate entrepreneurs on the business opportunities and sustainable practices.

7.2. Mediterranean Cooperation in the Treatment and Valorization of Olive Mill Wastewater (MEDOLICO)

MEDOLICO is a project carried out jointly by Mediterranean institutions from Cyprus, Israel, Jordan, Italy as well as a Portuguese Institution. Cyprus, is participating through the NIREAS International Water research Center, an institution of the University of Cyprus. The project aims to prevent and reduce the environmental risk presented by Olive Mill Wastewater (OMW). MEDOLICO will evaluate the performance of various promising OMW treatment technologies. Further, it will develop uniform treatment procedures according to the sought purpose (water for irrigation, recycling into the olive mill manufacturing process, etc.), which will then be pilot tested. There will be a further evaluation of the potential for valorization of the collected byproducts so that a solution can be provided that sustainably protect the environment heritage of the Mediterranean regions while remaining cost-efficient for the olive mills. The project is funded by the European Neighborhood and Partnership Instrument (ENPI) in the framework of the cross-border cooperation programme for the Mediterranean Sea Basin.

7.3.Climate KIC: Acceleration of climate innovation

A consortium formed by the Cyprus University of Technology, Cyprus Energy Agency and Chrysalis LEAP committed under the programme Climate-KIC to accelerate cleantech innovation in the country and above. The programme aims to among others to provide assistance on startups to mitigate their climate impact. A summer school is organized every year to educate entrepreneurs to develop solutions to climate change.

7.4.Business4Climate and Cyprus Innovation Award Competition

The Cyprus Employers and Industrialists Federation (OEB), the Cyprus University of Technology (project coordinator) and the Department of Environment of the Ministry of Agriculture, Rural Development and Environment, participate in the European programme Business4Climate. The programme aims to commit businesses to more actively involved in climate action by reducing their greenhouse gas (GHG) emissions by 8% until 2030. By the

end of 2018, more than 60 Cyprus Businesses committed voluntarily in this program and is expected to adopt eco - innovative measures in order to achieve this binding target. Project's activities include the development of a methodology for the identification of baseline GHG emissions, the training of businesses on climate action and the identification of available and future financing schemes of GHG reduction-related projects in Cyprus. The project is funded by the RIS Climate-KIC through the European Institute of Innovation and Technology (EIT).

Cyprus Innovation Award Competition is organized for 13 years by the Cyprus Employers and Industrialists Federation (OEB). The “Cyprus Innovation Award” has been placed under the auspices of the Minister of Commerce, Industry & Tourism and is actively supported by the Ministry of Commerce, Industry & Tourism and the Research Promotion Foundation. Given the E.U. policy on the promotion of innovation as well as the known need for continuous improvement of competitiveness of the Cyprus companies, as from 2006 OEB is establishing the “CYPRUS INNOVATION AWARD”. The Award is presented to companies/organizations/services either private or of the wider public sector which prove to be successful in the implementation of innovative ideas/practices.

Under the general title: “Cyprus Innovation Award”, four individual awards are given depending on the sector of activity, as follows:

- Innovation Award for the Primary Sector
- Innovation Award for the Manufacturing Sector
- Innovation Award for the Services Sector
- Innovation Award for the Public Sector

7.5. Other policy measures addressing circular economy and eco-innovations in Cyprus

EU Jeremie initiative

Jeremie co-financing product a new financial product implemented in the framework of the adoption of the Community Initiative JEREMIE in Cyprus and in accordance with which the Bank of Cyprus, the Government of the Republic of Cyprus and the European Regional Development Fund (ERDF) co-finance new loans for amounts of up to €100,000 to small and micro enterprises whose immediate objective is to support, expansion and strengthening of those businesses. These new loans will be available under particularly favourable terms, in relation to the repayment period, the grace period, the collateral required and in relation to pricing policy.

Eurostars Programme

Eurostars Cyprus, Specific Action of the «EUREKA Cyprus» Programme, supports the participation of Cypriot organisations in successful EUROSTARS projects. The «EUROSTARS Cyprus» Specific Action aims primarily to enhance the competitiveness of Cypriot R&D Performing SMEs, the networking and cooperation with organisations from abroad, the development of new or improved innovative products, processes or services through their participation in international industrial R&D Projects.

Sustainable Development Programme

The Sustainable Development Programme managed by the Research Promotion Foundation consists of four Actions: Natural Environment; Urban and Built Environment; Agriculture and Animal Farming; Fisheries and Aquaculture. Energy is addressed as part of these: the Urban and Built Environment Action, for instance, includes research on energy efficiency in buildings.

Technology Programme

The Technology Programme, managed by the Research Promotion Foundation, supports research in a number of scientific fields that are considered fundamental to the improvement of the state-of-the-art technology. The programme supports projects within the thematic areas of Materials, Nanotechnology, Energy, Applied Sciences and Engineering.

Information and Communication Technologies” Programme

The main objective of the “Information and Communication Technologies” Programme is to increase productivity and enhance the competitiveness of the business world in all economic sectors and moreover to improve the services provided to citizens, communities, enterprises and the public sector services. Particular emphasis is placed on the dissemination of knowledge for the efficient use of ICT and their incorporation in other activities such as education, health, culture, governance, commerce etc. Additionally, the Programme intends to achieve high levels of exploitation of the substantially competent scientific human resources of Cyprus, as well as the creation of collaboration networks between the academic and research organisations and the enterprises.

Technology Service of Ministry of Energy Commerce, Industry and Tourism (MECIT)

The Technology Service of Ministry of Energy, Commerce, Industry and Tourism implements schemes specifically to promote business innovation. The Technology Service undertook an intense initiative in 2011 to promote business innovation through the development of a programme to support business innovation with a view to encouraging local enterprises to develop innovative products and services on their own or in cooperation with other enterprises or research centres. The overall budget is EUR 4 million; the maximum funding per project is EUR 150,000. The intention is to implement a new business innovation programme over the period 2014-2020, with increased aid amounts.

7.6.Eco-Innovation Barriers

Development of eco-innovations in Cyprus is hindered by a series of structural factors. The R&D sector in the country is relatively new as it dates from the mid-90s (European Commission, 2017). As such, the system is still fragmented with a lack of coordination between the different stakeholders. The governance of research is lacking whereas the interface between research and business is inadequate. In addition, there is an inadequate evaluation culture to monitor research and increase its effectiveness. The Cypriot economy is heavily dominated by SMEs; hence, it exhibits a lack of sectoral concentration and of a critical innovative mass. This, in turn, reduces employment prospects for R&D related human resources and weakens the impact of relevant public policies and investments in education. The small size of business also decreases investments in innovation. Thus, R&D spending

from the private sector is one the lowest in the EU (European Commission, 2017). The geography and the structure of the economy also hinders an enhanced uptake of innovation (European Commission, 2017). The small size of the market and the remoteness of the island from other countries acts as a disincentive for high-tech companies to invest in the country. The only sector that is benefited by this structure and size is the financial one which in general, is not considered as research intensive.

8. Best practices in Cyprus

Since 2013, new sectors for **eco-innovation** have emerged, which has been supported by the implementation of funding and the economic development of the country. There a lot of sounded examples of best practices of eco innovation in Cyprus, either for planned or implemented projects, either for eco innovation businesses. Nevertheless, the most sounded cases are presented in the current section.

8.1.Nicosia Municipality: Smart City Development

The municipality has launched the project ‘Supply, installation and operation of infrastructure and smart city systems, focusing primarily on the needs for revitalizing certain areas and planning for integrated urban development. The project includes: the development of next-generation data networks, intelligent street lighting systems, smart mobility systems, waste management, as well as an integrated and open environment for digital development through the developer community. The plan includes installing electronic communications systems or ‘info points’ for promotion and strengthening tourism and cultural events in the capital, and intelligent lighting system for energy conservation and more efficient monitoring and maintenance. It also includes developing smart mobility application for the decongestion of traffic, ‘smart’ bus shelters informing commuters in real-time on public transport, and ‘smart’ parking information.

Intelligent waste management for better planning garbage collection is also part of the plan while environmental sensors for measuring, recording and offering the public information for markers such as moisture, dust, air microparticles and noise, will also be installed around the city. The project will be done in coordination with the capital’s Centre of Excellence in Research and Innovation (RISE). It is expected to be the flagship project for RISE. The project is co-financed from the European Structural and Investment Funds, the government and the Nicosia municipality.

8.2.Electric vehicles charging infrastructure in Cyprus

The e-charge service is offered by Electricity Authority of Cyprus (EAC) to electric vehicle owners based in Cyprus (since June 2014). With this service the owners of electric vehicles will have access to safe and reliable electric vehicle charging in public places where chargers have been installed. The electric vehicle owner must visit any Customer Service Center of EAC to sign the service agreement contract and receive the RFID card which will give him/her direct access to all the chargers that have been installed or will be installed by EAC in the future.

The charging system infrastructure is controlled and managed by the Networks Business Unit and monitors the charging of electric vehicle throughout the duration of the charging. The electric vehicle charging stations installed by EAC are using Mode 3 charging with two-way communication between the vehicle and the charging station throughout the duration of the charging period. There are two (2) Type 2 sockets in each charging station in accordance with the international standards and recommendations of the European Commission and

Eurelectric.

Each user of the system will be charged €25.00 on the first invoice and invoices will be sent to owners of electric vehicles every two months. The electricity charge will be based on tariff 15. If the RFID card is lost or the electric vehicle owner requires an additional card, then they need to contact the Networks Business Unit, at EAC Head Offices to reissue or issue an additional card. The semi-fast charging stations installed by EAC allow charging of electric vehicle up to 21kW (3-Ph). In each charging station there are two (2) Type 2, charging plugs and can serve two vehicles simultaneously at full load.

The electric vehicle charging stations have been installed in 18 selected points in public places covering the whole of Cyprus, in order to serve the electric vehicle owner to drive the electric car throughout Cyprus. EAC has installed 6 charging stations in the Nicosia Area, 4 in Limassol, 1 in Platres, 2 in Larnaca, 2 in Protaras, 2 in Paphos and 1 in Polis Chrysochous.

The main target of the e-charge Service is the promotion of the electric vehicle in Cyprus in order to protect the environment and reduce carbon emissions for a better and clearer environment for Cyprus and our society.

8.3.Awarded eco-innovation businesses

A. Primary sector - Paradisiotis LTD

Paradisiotis has been awarded during the 13th Cyprus Innovation Award Competition (2018) for CUBORA constant and fully controlled heating system, that is applying in its two ultramodern poultry premises. Innovation of CUBORA is based not only on a variety of its machines advantages but also to the fact that Paradisiotis Ltd is the first and only company that apply this system in Cyprus. CUBORA took its name from Ora village, where's the innovation has been developed.

This specific innovation stands out in importance due to its contribution to sustainable development and environmental protection.

More specifically CUBORA provides:

- Air Mixing
- No cold air gets on the chickens
- Hot air feedback
- Rotary motion 360°.
- Complimentary allocation of space
- Low humidity levels
- Stable room temperature with $\pm 0,5$ °C
- Operating height and hot air outlet control
- Low air velocity and tranquility in chickens
- No flame inside the premises
- Safe functionality
- Reducing energy costs

Immediate economic benefits arising from its application:

- Reduce the consumption of biomass by up to 50% compared to the compatible mode
- Reduce electricity consumption by 60%
- Reduction of boiler maintenance working hours by Technical Department up to 15%.
- Increase efficiency up to 10% (more quality and heavy chicken).
- Room moisture eradication
- Reducing the mortality rate for chicken
- Ideal housing conditions for the rational development and welfare of chickens
- Better prosperity and sustainable development
- Increase profitability and competitiveness

Indirect benefits:

- Automatic operation of Cubora
- Boiler's operation control
- Reduction of fuel consumption (pellet)
- Reduction of ash and exhaust emissions to the atmosphere
- Saving electricity

Paradisiotis Ltd had been awarded before with Save Energy Award and recently (last month actually) proceeded with the agreement of the First Energy Efficiency Convention (ESCO – Energy Service company) with E&B Energy Services provider. Thus, ensured not only energy saving approximately 480000kWh, but also 364 tones annually savings in Carbon Dioxide CO2 emissions.

B. Primary sector - Oleastro Enterprises Ltd

Oleastro Enterprises Ltd was established in 2003 with the vision to promote the civilization of the olive tree in an environmentally friendly way. Its mission is its uncompromising commitment to top quality olive oil, innovation, diversification, and flexibility. This company was awarded in 2013 for producing and trading extra virgin olive oil and for developing an innovative Olive Park at Anogyra village in Cyprus.

The ecological olive mill applies the latest ‘green’ technology and produces olive oil of the highest possible standard. It's a ‘first’ in Cyprus because it uses cold pressing with millstones, and it's the only mill certified to the ISO22000 (food safety and hygiene) and ISO9001 (quality) and ISO14001 (environmental protection) standards. The olive oil produced here maintains fully all its nutritional elements, original flavor, aroma, color, and polyphenols. The Olive Park Oleastro is unique, featuring aspects of the 60,000 years of the civilization of the olive, such as extraction methods, farming activities, representations of excavations, the olive tree in painting, professions related to the olive tree, the role of the olives and olive oil in the Mediterranean diet, customs, traditions, history, mythology and much more.

C. Primary sector - Riverland Dairy Biofarm Ltd

Riverland Dairy Biofarm was established in 2004 with the commitment to produce healthy food in a sustainable way, with maximum respect for the animals and the environment. It is the first farm of its kind in Cyprus to breed sheep and goats using organic feeds/pastures and practices, as well as introducing eco-friendly measures such as photovoltaic, solar panels and rainwater collectors. The farm produces certified organic dairy products (milk, halloumi, yoghurt, kefir), organic vegetables, antibiotic-free meat and free range eggs, which are sold through a chain of organic retail shops. Educational visits and activities in nature (kayaking, cycling, horse riding, archery) are organised for schools, tourists, families and corporate businesses. This company was awarded in 2011, for the Primary Sector Cyprus Innovation Award.

D. Manufacturing sector - Muskita Aluminium Industries Ltd

Winner of the Innovation Award 2018 in the Manufacturing Sector was Muskita Aluminium Industries Ltd for the implementation of the pioneer minimalist aluminum system for sliding doors and windows THEA Minimal Aluminium Frames. Inspired by the minimalist movement, the system combines Swiss precision and German Technology, having been designed and engineered to perfection by some of the industry's most skilled professionals utilizing Muskita Aluminium industries' state of art production facilities backed by over 50 years of experience in the field. It has a truly minimal frame with only 3mm of visible aluminium on side sashes and 20mm of vertical post and achieves an outstanding thermal efficiency, ideal for a passive house concept.

E. Manufacturing sector - Johnsun Heaters LTD

Smart Home Control has been developed by Johnsun Heaters Ltd to provide the Cyprus market with access to smart home solutions. Philosophy of this company is to provide products that are easily retrofittable into any household and provide the user with full control over their usage, no matter where they are. By gaining full control over the use of their appliances, our customers can enjoy significant savings in both cost and time.

Two eco-innovative products that are currently on the market are Aqualoup (monitoring and controlling domestic hot water by smartphone) and Melissa (controlling air conditioning at home by smartphone).

F. Manufacturing Sector - CYPET Technologies LTD

CYPET Technologies LTD is an international manufacturer of innovative single-stage Injection stretch blow-moulding systems for the production of PET bottles, jars, kegs and drums. CYPET currently offers 3 types of Injection stretch blow-moulding machines:

- Servo-Hydraulic toggle machines for low energy consumption
- Servo-Hydraulic Long-Stroke Machine Models for higher productivity and low energy consumption
- All-electric machines for clean room applications and minimum energy consumption

CYPET's single stage technology is patented and retains all the advantages of conventional single-stage technologies while adding 3 more: lower investment cost, lower energy

consumption and unparalleled flexibility in terms of the range of products (bottle, jars, kegs and drums) that can be produced on the same machine model just by changing moulds.

True to its core belief of creating value through innovation, in addition to the CYPET single-stage process that has been commercialized, CYPET Technologies has developed and commercialized a new, innovative PET preform production system with a novel intensive post cooling arrangement, that makes the system particularly suitable for thick preforms (for 5 – 20 litres large bottles).

The most recent innovation from CYPET is a patent pending system for moulded-in, incorporated handles on PET containers that will give PET bottles the same handle convenience that only HDPE containers could provide so far. The new PET handles are being developed and once commercialized will open up many new areas of application that were so far inaccessible to PET.

CYPET's dedicated technical team offers services such as design of cost-effective PET packaging, pilot moulding, turnkey project implementation, remote and on-site after sales technical Support.

G. Manufacturing Sector-Nicolaides and Kountouris Metal Company LTD

The biggest problem this company on the past, was the management of polyurethane waste resulting from production and use of polyurethane products. Unfortunately, industrial polyurethane waste can not be reused like other thermoplastic materials (e.g. polystyrene). This is the reason why, in Cyprus, until recently polyurethane waste ended in landfills and junky yards. Investing in research and high technology, the company has created an innovative application for the treatment of waste polyurethane foam.

The innovation consists of three parts:

- Creating a polyurethane waste management system, for the use of polyurethane waste from production and other polyurethane products, which arise from our company but also from other companies, enabling them to carry out their legislative obligations on waste management according to the waste management law from 2011 and 2012. The company has secured a polyurethane waste management license issued by the Environmental Department of the Ministry of Agriculture, Natural Resources and Environment of Cyprus.
- Acquiring technical know-how, construction of waste processing equipment and manufacturing a plant for the production of thermal insulating mortar based on granulated polyurethane foam.
- Production of thermal insulating mortar based on granulated polyurethane foam, THERMINK, with unique physical and mechanical properties for the use as a thermal and acoustic insulation in roofs, floors and ceilings.

As a continuation of the innovative project for which the company was awarded the Cyprus Innovation Award in the Manufacturing sector (2014), the company expanded permission management polyurethane waste management polyurethane waste license and polystyrene (extruded and expanded) and has produced an even insulating mortar based on recycled

polystyrene (PS THERMINK). The PS THERMINK material, just like the THERMIK material is also used for thermal insulation of floors, roofs and ceilings (may vary due to specifications). With this practice, the company helps to solve the problem of existence of vast quantities of expanded polystyrene waste (from packing boxes, fish markets , etc.) . And polyurethane (from structural and thermal insulation products , industrial and domestic refrigerators etc.) . These wastes until recently ended up in landfills. The «Nicolaidēs & Kountouris Metal Company Ltd » was awarded in 2016, with the FIRST Prize Cyprus Inneon Eco Innovation Award - Award Eco -Innovation Platform Inneon (Network of Eco-Innovation Investment) which is supported and funded by the European Union.

H. Public Sector – Cyprus Post

Cyprus Post launched in 2012 a new 24-hour parcel delivery service using automated self-service parcel terminals. With access 24/7/365, a client has the flexibility to pick up an item at his/her convenience, using a pin code sent via SMS. The service is available only for items that do not require the payment of taxes and duties and is offered in Nicosia, Limassol and Larnaka. This service is called Parcel 24 and was awarded in 2013, for the Public Sector Cyprus Innovation Award.

9. Conclusions

Despite significant improvement, Cyprus continues to perform poorly in eco-innovation. In 2017 and 2018, the country scored only 45 (EU average = 100). This places the country as last in the EU28 ranking of eco-innovative countries. This scoreboard defines Cyprus as a moderate innovator with great potential to expand its ability to innovate.

Eco-innovation in Cyprus is predominantly produced by individual actors – research institutes or enterprises. As such, there are no distinct and mature eco-innovation sectors.

Additionally, a number of EC funded research and innovation projects in the field of eco-innovation are currently under implementation.

Policy and funding measures and mechanisms for promoting eco-innovation in Cyprus depend to a significant extent on co-financing through the EU structural funds. Innovative SMEs, even in the leading economic sectors of the country, lack the critical mass which would facilitate smart specialization and the development of sectors with international competitive advantage in eco-innovation.

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