IMPACT ASSESSMENT REPORT OF COVID-19 ON THE SMEs' SECTOR AND THE CIRCULAR ECONOMY

Partnership: 7 partners – 4 countries (Bulgaria, Finland, Greece, Italy)

LP ANATOLIKI, Organization for Local Authorities

PP3 Metropolitan City of Bologna

PP4 ART-ER Joint Stock Consortium Company

PP5 Regional Council of South Ostrobothnia

PP6 JPYP Business Service

PP7 BAMEE, Bulgarian Association of Municipal Environmental Experts

PP10 Regional Development Fund of Central Macedonia

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INTRODUCTION

This report aims to document the impact of the Covid-19 pandemic on small and medium-sized enterprises (SMEs), with an emphasis on the areas of the circular economy and sustainable development. The report is a deliverable of the Interreg Europe CESME + project.

The report records the data found in the countries of Bulgaria, Finland, Greece and Italy. The areas of the countries participating in this project are at regional level, that is the region of South Ostrobothnia of Finland, the region of Central Macedonia of Greece, the region of Emilia-Romagna of Italy and the wider area of Sofia of Bulgaria, as Bulgaria is not divided in regions. The very large percentage of small and medium enterprises in these 4 areas is the reason for the emphasis of the report in this category of business sector. In all 4 areas, small and medium enterprises dominate, almost completely.

The individual national report of each country presents the data in a common structure and common chapters, so that the comparison between the data of each region can be more easily understood.

First, a description of each area is presented, with demographic and economic data. Also, a brief description of the methodology followed is given. The impact of the pandemic on the economic and environmental sectors is being documented. The report then focuses on small and medium-sized enterprises and the impact they faced. Here, each area followed the methodology it considered to yield more data, for example bibliographic review, studies, recent national reports, questionnaires to small and medium-sized enterprises, questionnaires to regional authorities and more. Through each methodology, an effort was made to connect the impact to the SMEs with the circular economy and sustainable development. Finally, the measures taken to mitigate the impact of the pandemic and the funding tools in each area are presented.

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1. Description of the area of study – Demographic and Economic Data

BULGARIA

Bulgaria entered the pandemic situation with macro-financial stability, low government debt and a lack of budget deficits. Traditionally, the country's economic growth has been supported by strong domestic consumption.

The global epidemiological crisis that broke out at the beginning of 2020 has posed new and unknown challenges to society and economy in Bulgaria and not only. The first case of COVID-19 in Bulgaria was confirmed on March 8, and a state of emergency was introduced on March 13 which lasted till May 13. Restaurants and shopping centres were closed; classes and all forms of group education were suspended, as well as the holding of mass events, including sports, cultural, entertainment and scientific events. On the part of the employers, depending on the specifics and possibilities of the respective labor activity, a 'home office' form of work was introduced for employees. A ban on the entry of third-country nationals was also introduced for a certain period. All these measures led to a significant decline in economic activity, and entire sectors, mainly related to services and requiring direct contact with customers, were directly affected by the restrictions imposed. As the actual restrictions were introduced in March, the negative effects of the COVID-19 crisis were most pronounced in the second quarter of 2020. The economy registered a decline in GDP by -4% in 2020, and the Bulgarian National Bank reported the most serious contraction of the economy by -8.5%. The largest negative impact in 2020 was on gross capital formation (-5.0%) and consumption (-3.6%).

Table 1: Forecasts for GDP growth, inflation and other economic indicators (%)

	2019	**2020**	**2021**	**2022 prognosis**
GDP growth	3.7	-4.1	3.3	3.7
Consumption	5.5	-0.7	2.7	3.1
Net export	3.9	-10.7	6.0	5.71
Net import	5.2	-9.9	6.1	5.3
Unemployment	4.2	6.4	6.4	7
Gross capital formation	4.5	- 8.4	5.8	4.4
Annual inflation rate	2.5	3.3	7.8	9

Source: OECD database and National Statistical Institute

Main upward pressure on the inflation is coming from food & non-alcoholic beverages (11.2 percent); housing & utilities (13.2 percent); and transport (21.3 percent).

The speed and form of economic recovery continues to be disputable, as uncertainty remains about the spread of the virus. In response to the new global challenge, individual countries are constantly changing their measures, thus shifting new shocks among the economies. This trend means that consumption and investment will remain permanently suppressed, thus negatively affecting GDP growth.

During the Covid-19 pandemic, the unemployment rate rose from 4.2 to 6.5 % (2020 and 2021). Many Bulgarians working abroad returned home. The service sector suffered the biggest job losses were due to the restrictions imposed and the closure of the national borders.

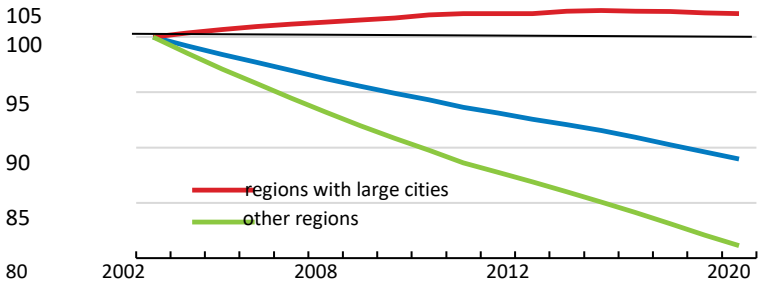
The factor that potentially increases the risk for the Bulgarian economy is the large number of small and medium enterprises (SMEs), which are expected to be most affected by the crisis - over 98% of all companies in the country.

According to the report, published by the Ministry of Finance in September 2021 (Bulgaria, Economic outlook, OECD) the COVID19 crisis is affecting differently the regions in Bulgaria and their development.

Regions with large cities like the capital city Sofia, Plovdiv, Varna drive growth in Bulgaria, while many rural regions suffer from depopulation and rapid aging of the population.

Fig. 1 Depopulation and urbanization of the regions in Bulgaria

Index 2002 = 100
Large city – City with more than 250 000 inhabitants



Source: National Statistical Institute

Some important key findings are outlined:

The pre COVID growing economy translated into robust household disposable income growth. However, income inequality exceeds almost all OECD countries. Regions with large cities are driving growth in Bulgaria, while many rural regions suffer from depopulation and rapid ageing.

Poverty remains elevated, particularly among ethnic minorities, the elderly and children, and in rural areas. Cash transfers to protect the most vulnerable from income shocks are low and restricted. The combined average income tax and social contribution rate for lower-wage workers is comparatively high and does little to reduce income inequality.

Health care needs to be strengthened. Hospital capacity is high, but primary care is underdeveloped due to significant gaps in health insurance coverage and large out-of-pocket payments. To address the pandemic, the government made treatment of COVID-19 available to all. Yet, access to health care is restricted in many regions, due to low numbers of general practitioners, which results in frequent hospital visits.

Residential mobility is very low in comparison with OECD countries. While Bulgaria has a high number of dwellings per capita, overcrowding is common and a large share of young adults live with their parents. High homeownership and low affordability are the main obstacles to residential mobility and resolving

housing market imbalances. Housing allowances and social housing are underdeveloped. The targeted heating allowance increased substantially in 2019, but is the only support programme of significant size and distorts incentives for energy renovation.

Investments in infrastructure and housing reform would help to boost mobility and strengthen linkages to national and international supply chains. Regional income differences in Bulgaria are larger than in most OECD countries and growth has been lower in regions without larger cities. Increasing the long-term value-added of tourism and agricultural activities can assist in local economic development. Improving living standards for all regions will require better coverage and access to public services, notably in health and long-term care.

The economy is carbon- and energy-intensive. Coal continues to account for almost half of energy production, though the share of renewables has increased above the OECD average. The potential to improve energy efficiency is large. The COVID-19 recovery presents an opportunity to decarbonise the economy, especially the energy mix and housing stock, which could benefit from abundant EU green funds.

FINLAND

General information

The Region of South Ostrobothnia is located in Western Finland. It is formed by **18 municipalities** and has a total population of **192.150 residents**. In terms of population South Ostrobothnia is the 9th biggest region of Finland's 15 regions and amounts about 3,5 % of whole Finland's population.

The capital city of the region, **Seinäjoki**, is a vibrant city with 64.000 residents that has benefitted from a steady population growth since 1951 – the longest period of growth among all regional centres in Finland. It is the only municipality that has been growing in terms of population for the past 10 years.

Picture: Regional Council of South Ostrobothnia

South Ostrobothnia in numbers

- Area: 14 355 km2
- Population (2021): 192 150
- Unemployment rate (2020): 6 %
- Employment rate (2020): 75,5 %
- GDP per habitant (2020): 32 977 €
- Number of companies (2020): 15 697
- Revenue of enterprises (2019): 10,3 mrd. €
- RDI-investments / habitant (2019): 217 €

Sources: Regional Council of South Ostrobothnia.
Statistics website. https://epliitto.fi/tilastot/

Region of entrepreneurship

The region of South Ostrobothnia is famous entrepreneurship and entrepreneurial spirit. In 2019 there were 11 007 entrepreneurs that amounted 13,9 % of all the employed people. The number of entrepreneurs has been decreasing throughout the 2010's but is still clearly the highest of Finland's 15 regions.

In 2020 there were over 15 697 companies located in the region amounting 3,9 % of all the companies in Finland. The number of companies has grown almost every year between 2013 and 2020 widely in all, except one, municipalities in the region.

The biggest industry branches in terms of number of companies in the last quartal of 2020 were wholesale and retail trade (2560 companies), construction (2 371) agriculture, forestry and fishing (2 010) and manufacturing (1 698).

Companies by their industry branch in South Ostrobothnia (last quartal of 2020). Source: Statistics Finland (2021).

Industry branch	South Ostrobothnia
In Total	15 924
Wholesale and retail trade	2 560

Construction	2 371
Agriculture, Forestry and Fishing	2 010
Manufacturing	1 698
Professional, Scientific and Technical activities	1 395
Real Estate Activities	1 211
Other Service Activities	981
Transportation and Storage	914
Administrative and Support Service Activities	627
Accommodation and Food Service Activities	442
Human Health and Social Work Activities	405
Arts, Entertainment and Recreation	362
Information and Communication	302
Education	175
Mining and Quarrying	162
Water supply: Sewage, Waste Management and Remediation Activities	112
Financial and Insurance Activities	97
Electricity, Gas, Steam and Air Conditioning Supply	73
Unknown	21
Activities of Households as Employers	6

The Region of Food, Wood and Metal

South Ostrobothnia plays a key role in the Finnish food technology development and security of supply. Region's farmers grow cereals and vegetables and keep beef cattle and poultry. The region is a major hub of food industry with two-thirds of the production catering for customers and consumers outside the region. The region is also home to several beverage producers as well as agri-food technology companies.

The region has long and proud traditions in a variety of crafts. For centuries, the region's joiners, carpenters and textile-makers have produced furniture and fabrics with skills that have been passed from one generation to the next. Businesses in the traditional fields have never lost sight of their roots when taking their traditional industries to the new age.

South Ostrobothnia has a dense network of small and medium-sized sawmills and other wood industry enterprises, often family-owned. The region produces innovative wood materials for the construction industry to build large housing blocks and public buildings.

The region has several technology clusters, and the regional center Seinäjoki serves as a major logistical hub. The region is also home to a highly specialized metal subcontracting industry, including a number of larger companies who, with their own products and exports, lead the sector forward.

Environmental data

According to the Finnish Climate Panel, the climate in Southern Ostrobothnia has warmed so that in the **period from 1991 to 2020 the climate is about 0.6 °C warmer than the period from 1981 to 2010**. The average temperature in Southern Ostrobothnia will be around 1.8–3.0 ° C in the middle of the century higher than the present depending on future greenhouse gas emissions development worldwide. Annual **rainfall is expected to increase in the region of about 5-8%**,

which means that on average it rains about 630-700 mm per year. **Winter is estimated to shorten by 40-50 days** to the 2050s and other seasons will be extended by 10 to 30 days. (Finnish climate panel 2022)

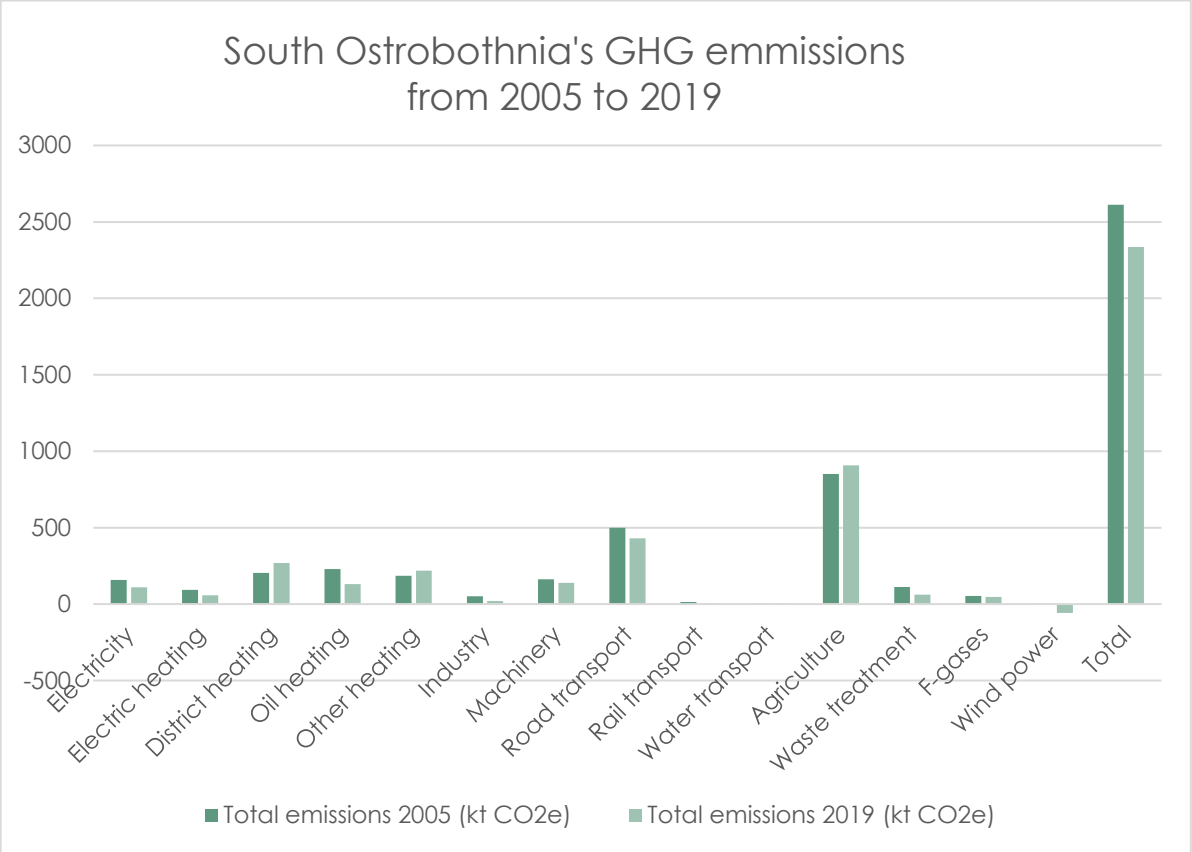
Climate change can have positive effects to the society but also damage various functions of society. The region needs to both adapt and prepare to the climate change affects. There is a need to reduce the risks and dangers to people or financial damage. Droughts, heavy rains and plant diseases and pests may have a strong effect to the agricultural productivity and need adaptation.

Southern Ostrobothnia is a flood-prone area that is accustomed to abundant spring floods. With climate change, floods may become more common in other seasons as well. The key flood risk areas in the region have been prepared by the ELY-Centre with flood risk management plans setting out flood risk management objectives and the measures taken to achieve the objectives.

Greenhouse gas emissions in Southern Ostrobothnia have decreased between 2005 and 2019 between 9 % and 6% per capita. In Finland the reduction has been 20% and 24% per capita. However, the direction of emissions is declining. Most of South Ostrobothnia's emissions come from agriculture (38 %) and heating and energy solutions combined (32 %) and traffic (20%). Emissions have decreased between 2005 and 2019 in almost all sectors, but agriculture, district heating and other heating emissions have increased (see figure under). (Hinku calculation, SYKE 2022.)

Figure: South Ostrobothnia. GHG emissions from 2005 to 2019.
Source: SYKE - GHG Emissions in Finnish Municipalities and regions.

	Total emissions 2005 (kt CO2e)	Total emissions 2019 (kt CO2e)	Change of emissions (%)	Emissions per person 2005 (tCO2e)	Emissions per person 2019 (tCO2e)	Change of emissions per person (%)
Electricity	157,4	109,5	-30,4	0,8	0,6	-28,4
Electric heating	94	57,2	-39,1	0,5	0,3	-37,4
District heating	204,8	268,7	31,2	1	1,4	35
Oil heating	228,1	129,9	-43	1,1	0,7	-41,4
Other heating	185,9	218	17,3	0,9	1,1	20,7
Industry	51,2	18,9	-63,1	0,3	0,1	-62
Machinery	162,5	139,4	-14,3	0,8	0,7	-11,8
Road transport	499	429,2	-14	2,5	2,2	-11,5
Rail transport	12,8	5,6	-56,5	0,1	0	-55,2
Water transport	2,2	1,8	-20,7	0	0	-18,3
Agriculture	851,5	906,9	6,5	4,3	4,7	9,6
Waste treatment	111	61,3	-44,7	0,6	0,3	-43,1
F-gases	52,7	47	-10,8	0,3	0,2	-8,2
Wind power	-0,1	-57,6	71059,3	0	-0,3	73139,8
Total	2613	2335,6	-10,6	13,1	12,1	-8


South Ostrobothnia's GHG emmissions from 2005 to 2019
3000
2500
2000
1500
1000
500
0
-500
Electricity
Electric heating
District heating
Oil heating
Other heating
Industry
Machinery
Road transport
Rail transport
Water transport
Agriculture
Waste treatment
F-gases
Wind power
Total
Total emissions 2005 (kt CO2e)
Total emissions 2019 (kt CO2e)

GREECE

Image 1: Map of Region of Central Macedonia

The Region of Central Macedonia geographically covers the central part of Macedonia, with the exception of the peninsula of Mount Athos which is governed by a special regime. It is bordered on the north by Northern Macedonia and Bulgaria, on the east by the Region of Eastern Macedonia and Thrace, on the west by the Region of Western Macedonia and on the southwest by the Region of Thessaly. At the geomorphological level, Central Macedonia has a strongly mountainous character (INSETE, 2019).

The Region of Central Macedonia represents 17% of the total population of Greece. According to the Hellenic Statistical Authority (https://www.statistics.gr/), the estimated population of the Region of Central Macedonia in the year 2020 was 1,872,102 people. Its population, in the period 2013 - 2018, decreased by -2%. Regarding the shares of the individual ages of the population for 2018, it is observed that the highest share is held by the ages 45-64 years (28%), followed by the ages 65+ years (22%), 30-44 years (20%), 15 - 29 years (15%) and 0-14 years (14%) (INSETE, 2019).

According to the latest available data from the Hellenic Statistical Authority and the Statistical Register of Companies for the year 2018, for the Region of Central Macedonia the number of companies amounts to 236,694, the turnover (in thousands of euros) to 31,766,172 and the number of employees at 613,299. It occupies the second position in number of established enterprises in Greece, thus 16.7%, the second position in terms of turnover with a percentage of 10.5% and the number of employees constitutes 14.45% of the total. In addition, the Region of Central Macedonia represents 14% of the total GDP of the country (INSETE, 2019).

ITALY

Emilia-Romagna Region.

Demographic and Economic Data [1]

Analyzing demographic and economic data before the Covid 19 pandemic, the Emilia-Romagna Region (2019) represents 7,4% of the entire Italian population, with a total of about 4,5 million residents. A value growing at a more intense rate than the national average, thanks to a significant capacity to attract both the foreign population and the Italian one coming from other regions.

Compared to the national total, Emilia-Romagna welcomes 8,3% of the total workforce, 8,7% of the employed, 9,3% of the total number of employees in companies, 9,2% of GDP and imports and 14.0% of exports. From these simple data it is clear the economic and productive weight of the regional system on a national scale. In absolute terms, in Emilia Romagna, in 2019 there were all 2.032,6 thousand employed. Also with reference to 2019, the activity rate in Emilia-Romagna rose to 74,6% (the highest value ever), the employment rate reached the 70,4% (second highest figure in Italy), and the rate of unemployment fell to 5,5% (second lowest figure in Italy). In addition, indicators of the youth employment rate and gender gaps are also improved.

Due to Covid-19 pandemic, the 2020 year represents for Emilia-Romagna the end of a positive five-year economic cycle, which overall has marked a growth of about 7% of regional GDP.

According to the most up-to-date estimate, Emilia-Romagna's real GDP should have shrunk in 2020 of -9,1%, in line with the national average (-8,9%).

Based on the most recent estimates, for the 2021 year, a positive rebound (+6,5%) is expected, which will not be enough, however, to immediately recover the accumulated losses. Thanks to a sustained dynamic also in 2022, Emilia-Romagna could reach and exceed the pre-Covid-19 GDP level.

The regional employment figure in 2020 is also declining, in fact, the estimate of employed in the region is equal to 1.970,9 thousand units, down by 58,9 thousand compared to 2019 (-2,1%)

Metropolitan City of Bologna

The Statistical service of the Metropolitan City of Bologna, processed data about the metropolitan area both demographic, processing data of the Italian nation statistical service (ISTAT), and economic, processing data of the Chamber of Commerce of Bologna.[2]

The data available were updated in December 2020.

Demographic Data (Available data: December 2020)

[1] Documento strategico regionale per la programmazione unitaria delle politiche europee di sviluppo 2021-2027, april 2020, Emilia Romagna Region.

[2] All the elaboration cited are available on http://inumeridibolognametropolitana.it/.

The area in which the metropolitan area expands is about 3.700 sq km and is distributed, in 1.393 sq km surface area of wholly mountainous municipalities, 1.624 sq km of non-mountainous municipalities and 684 sq km of partly mountainous municipalities. The average population density is about 271,9 kmq inhabitants, with maximum in the municipality of Bologna and in Casalecchio di Reno, a small municipality bordering the county seat.[3]

In the period from 2003 to 2020, the resident population experienced an average annual change of +0.51% (+4.974 residents per year), with differences within the period: in the period 2003-2010 the population varied on average by +0.85% (+8.134 residents per year) while in the period 2010-2020 of +0.27% (+2,762 residents). In year 2020 we see a negative value.

In the Metropolitan City of Bologna, on 31st of December 2020, the total population is 1.019.539 people of whom 492.425 are males and 527.114 are females.

Compared to 2019, this population decreased by -0,19%. or -1.962 residents. 119.564 people have a foreign citizenship, that is the 11,7% of the total population: 54.635 males and 64.929 females.

The majority of the population live in the county seat Bologna that has 394.463 inhabitants and a percentage of foreign citizens of the 14,8%.

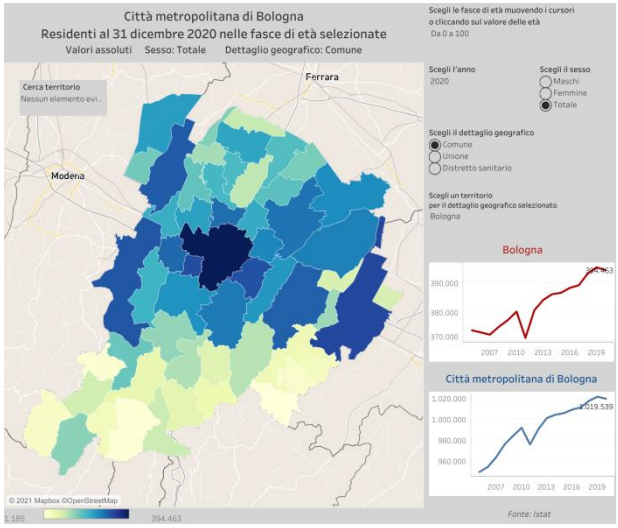


Figure 1 Metropolitan City of Bologna: total residents on 31st December 2020, source: http://inumeridibolognametropolitana.it/, data processed by Metropolitan City of Bologna on Istat data.

[3] Città metropolitana di Bologna, Bologna piano strategico metropolitano, 2016a

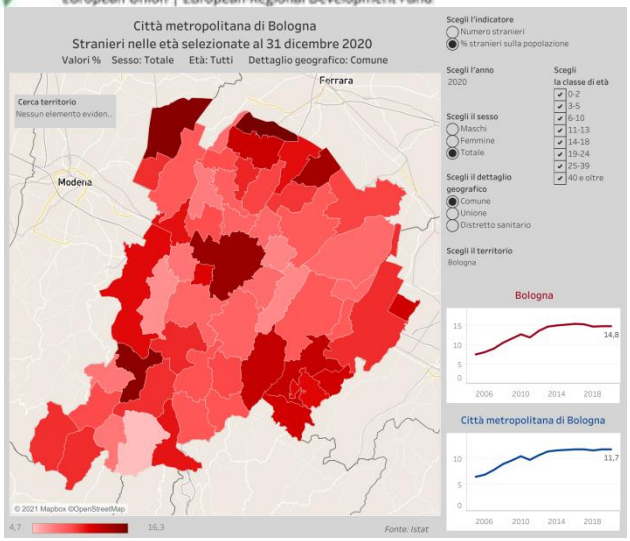


Figure 2 Metropolitan city of Bologna: foreign residents on 31st December 2020, source: http://inumeridibolognametropolitana.it/, data processed by Metropolitan City of Bologna on Istat data.

In the Metropolitan City of Bologna, the majority of foreign residents has the citizenship of Romania, Morocco, Pakistan, Albania and Ukraine.

In the county seat Bologna, Romania, Philippines, Bangladesh, Pakistan, China are the main states of origin of foreign residents.

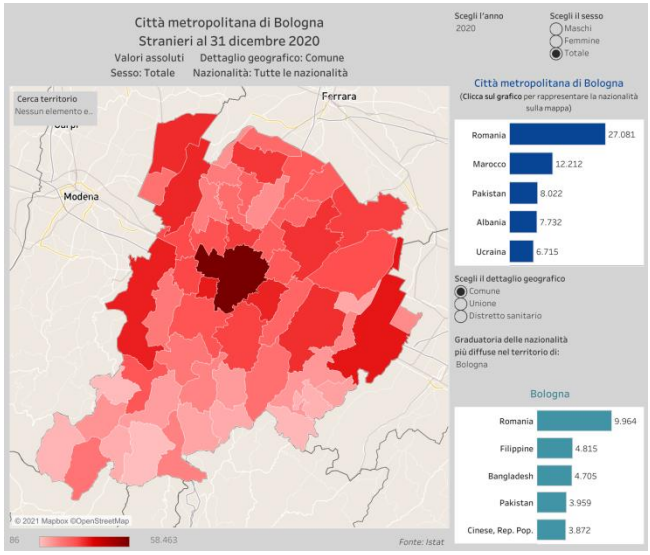


Figure 3 Metropolitan city of Bologna: foreign residents and main citizenships on 31st December 2020, source: http://inumeridibolognametropolitana.it/, data processed by Metropolitan City of Bologna on Istat data.

Economic Data (Available data: December 2020)

The metropolitan city of Bologna, during the years preceding the Covid-19, presented an economic situation that showed a low growth rate of the enterprises, compared with the biggest metropolitan cities in Italy like Milan, Rome and Neaples but in line with the ones with an average dimension like Bologna itself.

At the same time, Bologna had good results in terms of economic dynamism, entrepreneurial density and employment density, a good level of internationalization and export, a good rate of youth entrepreneurship and an excellent level of GDP in the period between 2008 and 2014, despite the economic crisis.[4]

The metropolitan area, considering the situation about the birth and the death rate of enterprises, compared with the other metropolitan cities in Italy, in the year 2020 presents a situation of strong decrease of the productive system. The birth rate is in line with the national value, but it is the second city for death rate and also the growth rate is negative. The decreasing started in 2018 but it is very strong in 2019 and 2020.

[4] Città metropolitana di Bologna, Bologna piano strategico metropolitano, 2016b

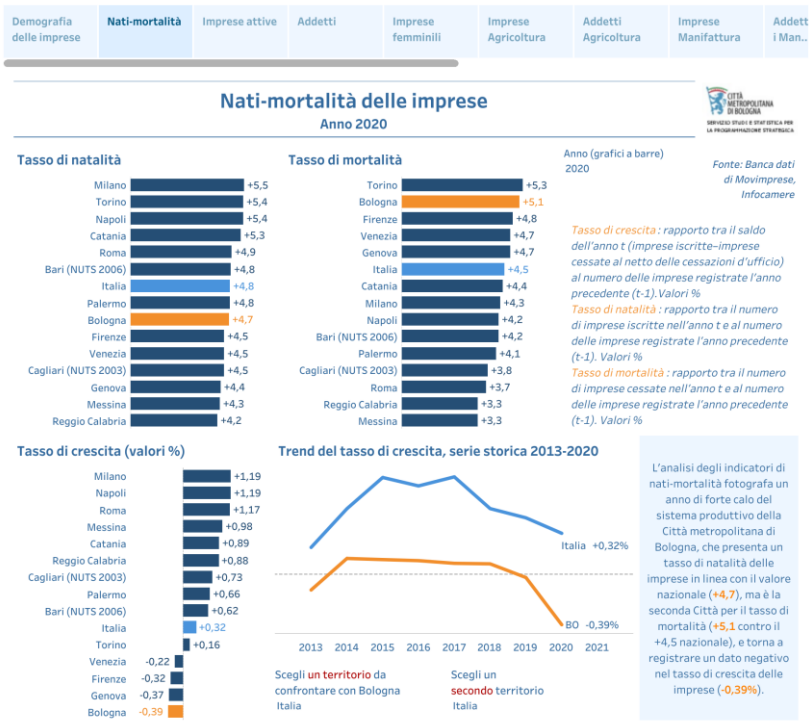


Figure 4 Metropolitan city of Bologna: Born and death of enterprises, year 2020, source: http://inumeridibolognametropolitana.it/cittametropolitaneconfronto/economia/imprese/imprese-e-addetti , Database of movimprese, infocamere

Compared with other metropolitan cities, the metropolitan city of Bologna is fifth for the number of innovative starts-up that are 319. These are 3,8 innovative start-ups for every 1.000 companies in the area: a value higher than the Italian average (2,3) and, among the 14 Italian metropolitan cities, second only to Milan. The trend was growing till 2018 and in the last two years is stable.

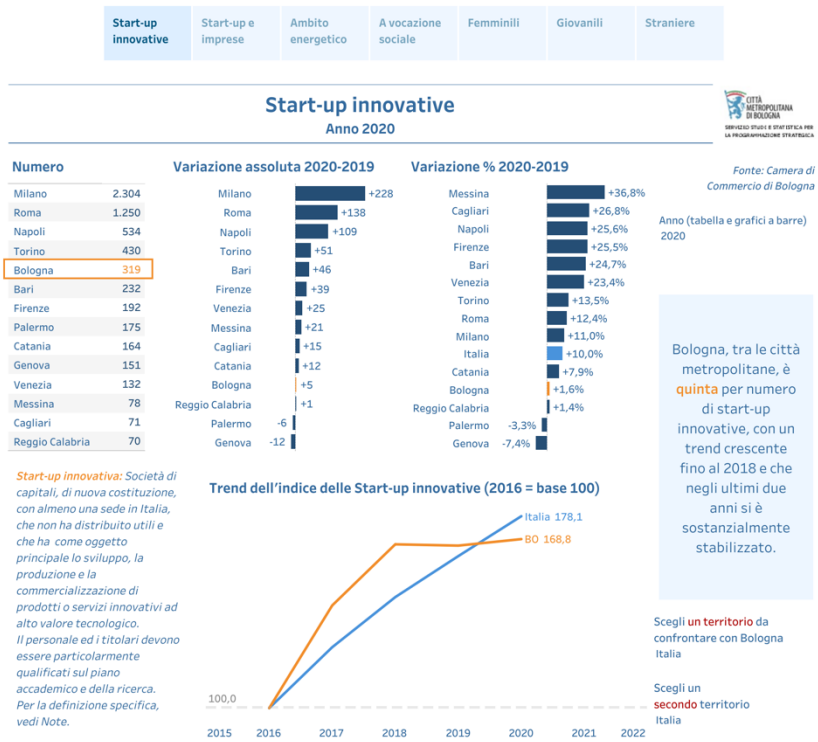


Figure 5 Metropolitan city of Bologna: Innovative start up source: http://inumeridibolognametropolitana.it/cittametropolitaneconfronto/economia/imprese/start-innovative data of the Chamber of commerce of Bologna

On 31st of December 2020, 94.775 companies were registered in the metropolitan area, 83.605 of them are active.

In 2020, the balance between companies registered and cancelled is negative: the registrations are 4.499 and the cancellations are 4.869, with a negative balance of 370 units.

The rate of growth is negative and there is a worsening, comparing the situation to the previous year.

The municipality of Bologna, differently than the metropolitan area, registers a growth.

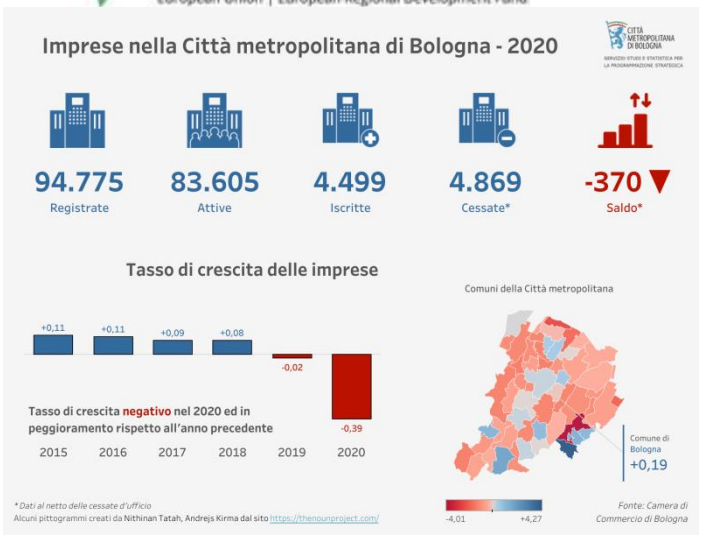


Figure 6 Metropolitan city of Bologna: enterprises in 2020, source: http://inumeridibolognametropolitana.it/, data processed by Metropolitan City of Bologna on data of the Chamber of Commerce of Bologna.

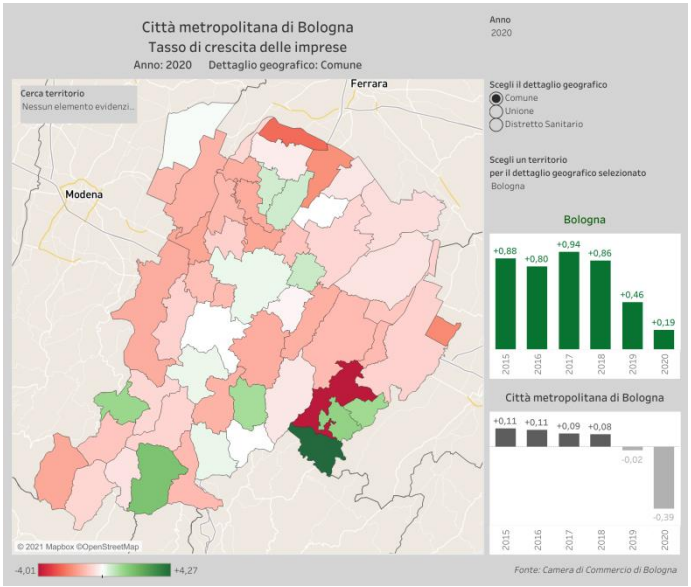


Figure 7 Metropolitan city of Bologna: growth tax of enterprises in 2020, source: http://inumeridibolognametropolitana.it/, data processed by Metropolitan City of Bologna on data of the Chamber of Commerce of Bologna.

The rate of entrepreneurship in the metropolitan area is of 81,8 active enterprises every 1000 inhabitants.

The feminine enterprises represent the 21,3% of the total, the enterprises managed by foreign entrepreneurs are the 12,9% and the juvenile enterprises (managed by entrepreneurs up to 35 years) are the 7,1%.

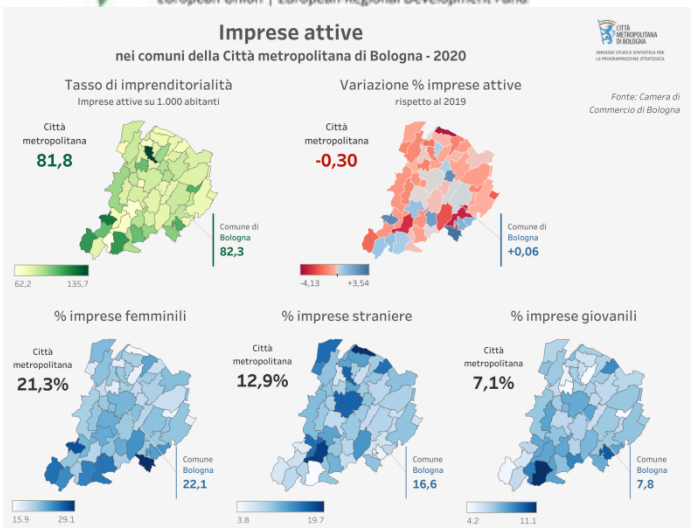


Figure 8 Metropolitan city of Bologna: active enterprises in 2020, source: http://inumeridibolognametropolitana.it/, data processed by Metropolitan City of Bologna on data of the Chamber of Commerce of Bologna.

The macroeconomic sectors in the metropolitan area are: other services (34,3%), trade, accommodation and restaurant business (30,8%), buildings (15,1%), industry (10,3%) and farming (9,5%).

In detail, the ten main economic sectors are: trade (23,4%), buildings (15,1%), manufacture (9,9%), farming and fishing (9,5%), real estate activities (7,7%), accommodation and restaurant business (7,4%), professional activities (5,1%), other personal services (4,5%), transport (4,4%), services for enterprises (4,4%).

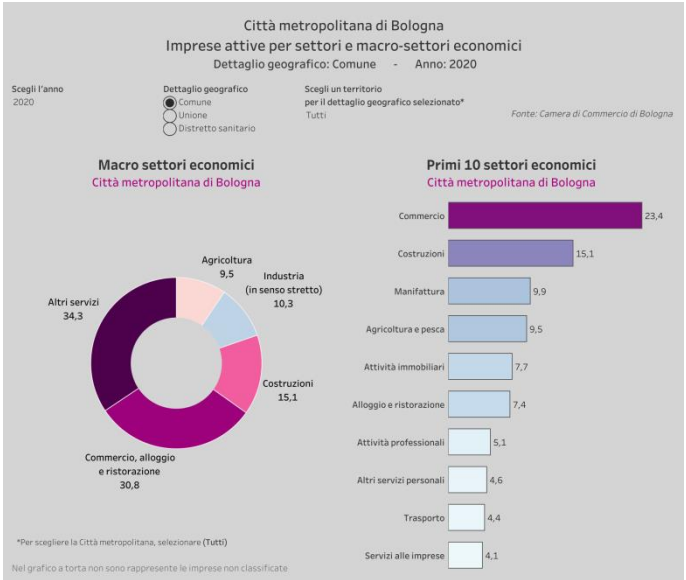


Figure 9 Metropolitan city of Bologna: Macro economic sectors and 10 main economic sectors, source: http://inumeridibolognametropolitana.it/, data processed by Metropolitan City of Bologna on data of the Chamber of Commerce of Bologna.

Concerning the sectors, in 2020, agriculture, manufacturing, transport and trade are declining, while education, health and business services are growing.

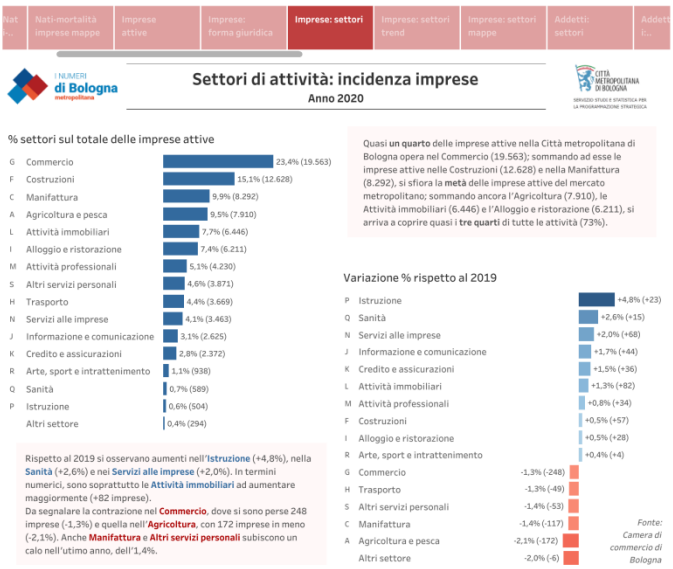


Figure 10 Metropolitan city of Bologna: Variation in economic sectors 2019-2020, source: http://inumeridibolognametropolitana.it/studi-e-ricerche/le-imprese-nella-citta-metropolitana-di-bologna-2020, data processed by Metropolitan City of Bologna on data of the Chamber of Commerce of Bologna.

The decline of the number of employees in companies is evident (-2,8%), in 2020 fell to 393.678, that is 11.156 employees less than the previous year.

In this case, the sectors most affected - in absolute terms - are business services (-3,463 employees) and accommodation and restaurant business (-2,770 employees), despite the growth - for both sectors - in the number of active companies.

On the other hand, the decline in transport (-1,944 employees) and trade (-1,847 employees) is in line with the decline observed in active enterprises.

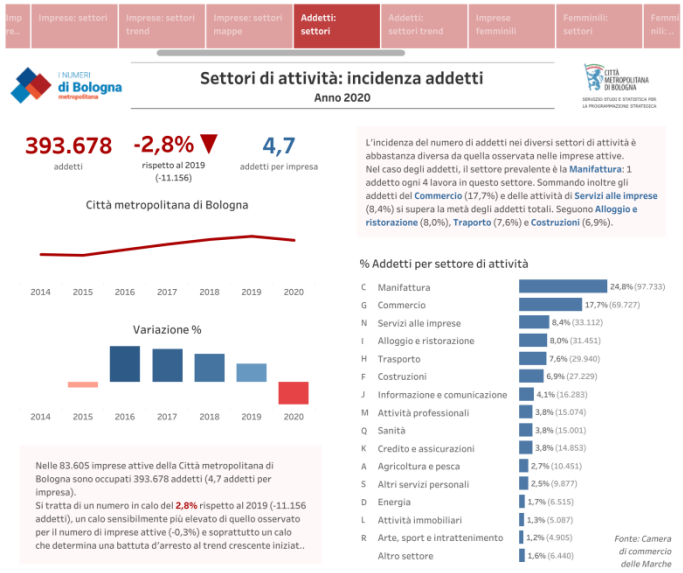
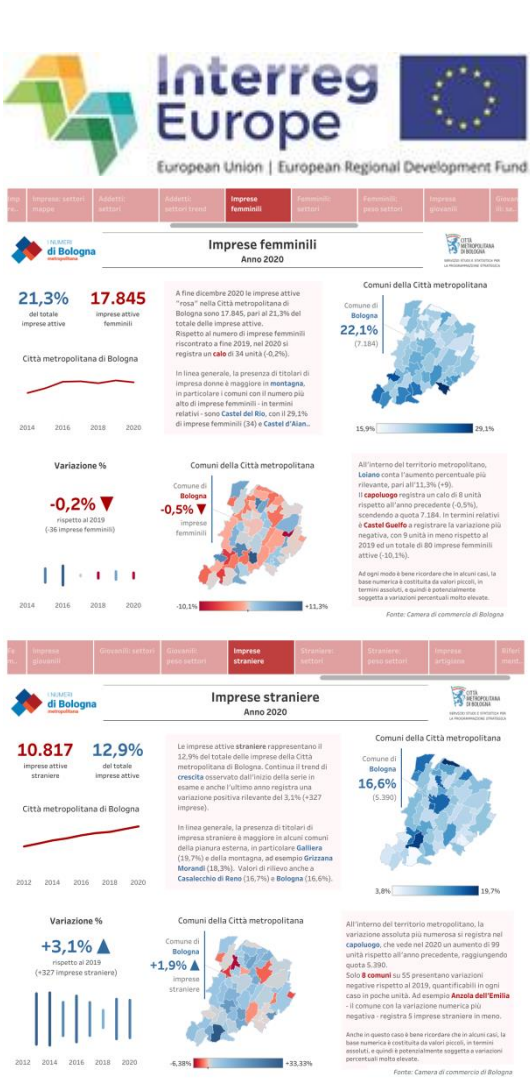


Figure 11 Metropolitan city of Bologna: Sector of activity: incidence of employees, source: http://inumeridibolognametropolitana.it/studi-e-ricerche/le-imprese-nella-citta-metropolitana-di-bologna-2020, data processed by Metropolitan City of Bologna on data of the Chamber of Commerce of Bologna.

In general, the female active enterprises and the juvenile ones fall, respectively of 24 units (-0.2%) and of 122 units (-2.0%); while in 2020 the growth trend of foreign enterprises is not interrupted, the increasing was of 327 enterprises (+3.1%).



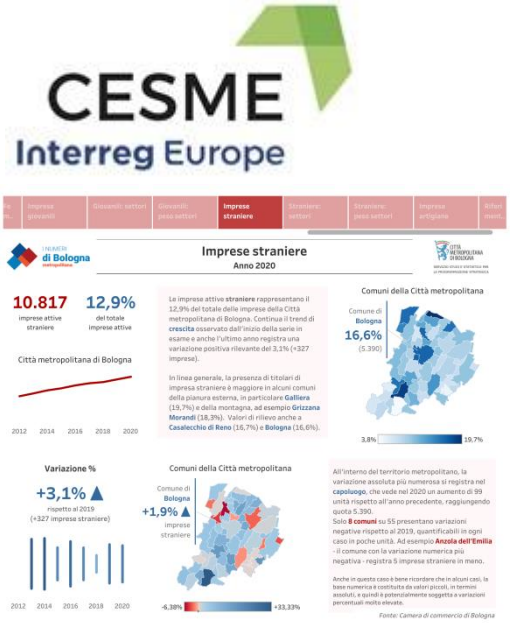


Figure 12 Figure 13 Figure 14 Metropolitan city of Bologna: Feminine, foreign and juvenile enterprises: variation, source: http://inumeridibolognametropolitana.it/studi-e-ricerche/le-imprese-nella-citta-metropolitana-di-bologna-2020, data processed by Metropolitan City of Bologna on data of the Chamber of Commerce of Bologna.

2. Impact of the pandemic on the economic sector

BULGARIA

Bulgaria has an open economy with a large manufacturing sector integrated into global value chains. A stable macroeconomic framework and deepening European integration have paved the way for joining the eurozone. Before the pandemic, unemployment was at record lows and wages rose sharply. Serious structural reforms have been carried out to increase productivity, speed up the process of catching up with EU average and addressing social challenges. The COVID-19 pandemic stopped this development, with decline in GDP not seen since the 1996-1997 banking crisis. With highly open economy that is dependent on exports, particularly related to the processing and assembly of foreign inputs into manufacturing export goods, Bulgaria's recovery is vulnerable to further shocks and to external demand.

Economic activity contracted sharply when confinement measures were first introduced to contain the pandemic. Travel, accommodation and food services suffered a large contraction. Manufacturing is mostly export-oriented and was hit by initial large volume and price declines. The economic sectors of tourism, transport, trade and more labor-intensive manufacturing sectors are the hardest hit by the COVID-19 isolation rules. The entertainment industry was also negatively affected.

The different sectors have been damaged by the Covid crisis with different intensities.

Few high-tech sectors such as pharmaceuticals and biomedical are suffering to a lesser extent or, in some cases, are even experiencing an expansion of the market opportunities.

COVID-19 pandemic impact on **the pharmaceutical sector in Bulgaria**

It is believed that the IT sector is not only sustainable, but it will also benefit from the crisis. **The Covid-19 pandemics did not affect the outsourcing industry in Bulgaria.** Bulgaria has been traditionally one of the most popular outsourcing destinations for business processes related to IT, software engineering, data infrastructure, accounting, HR, customer support, etc. Even during the pandemic, this sector in the country remained stable providing employment to over 70 000 people. It is also expected that the model "work from home" will continue for 2022. The demand in the areas of security, digital transformation, cloud services and artificial intelligence is expected to further increase in the coming years.

The demand for **courier services and part-time work** has grown as well.

As a result of the restrictive measures and the observance of social distance, a large part of the consumer habits of the population are also changing. Services that require direct contact such as public transport, tourism, restaurant dining, and leisure activities are avoided. This is confirmed by the data on the turnover in services in the second for 2020 and first half of 2021 of NSI.

The turnover in transport services has reported a decline, which is directly related not only to domestic transport, but also to the general drop in foreign trade and transport of goods. The biggest and sharp contraction was felt in the activity of tour operators, which was extremely limited (a nearly 95% decline in the second quarter). Parts of the funds usually spent by households on these services were redirected to other goods and services. Social distancing will lead to a rising number of people shopping online. In

Bulgaria, this share is still low (21.7% in 2019 compared to the EU average of 60%), which creates opportunities for growth in e-commerce. This is confirmed by the increase in the turnover of courier

services by as much as 21.6%. The restriction of social contacts and the number of people working remotely led to higher costs of telecommunications services (11.8%), information services (12.2%) and information technology activities (5.7%).

Since March 2020, first lockdown, and currently the National Statistical Institute of Bulgaria a monthly short business survey among industry and tourism sector in Bulgaria in order to provide information on the COVID-19 impact on various sectors of the economy in the country: https://nsi.bg/en/content/18153/basic-page/survey-results-related-impact-state-emergency-business.

In **the tourism sector** by means of accommodation the decrease of revenues from the activity started with reported 78% in April 2020 compared to March 2020 and in January 2022 – 49.7% compared to December 2021. The overall decrease in revenues for the sector for 2020 was 54% while for 2021 is 35%.

With regard to the employees, 24.7% of the managers took as a measure 'unpaid leave', followed by 'paid leave' - 17.6%, and 'release/reduction' - 13.6%. 9.7% of the managers benefited from 'part-time work', 7.7% took the measure 'reduction of staff remuneration', and 5.3% - from 'remote form of work'. At the same time, 32.2% of the accommodation establishments have benefited from the government measures to support employers.

The only positive development is seen in **the alternative tourism**. The alternative forms of tourism, particularly ecotourism and rural tourism in Bulgaria have developed successfully even in the conditions of the pandemic. There are specific reasons for this, which have been clarified in a report of ***Impact of the COVID 19 Pandemic on the Development of Rural and Ecological Tourism in Bulgaria*** and this once again has proven that people cannot live away from nature for a long period of time. Ecotourism and rural tourism provide people the opportunity of not gathering in large groups, keeping their distance, and at the same time remain close to nature, and this is the winning strategy for tourism to successfully continue to exist, even in the conditions of a pandemic. including: cultural monuments, which are part of the UNESCO cultural heritage, church schools, all sorts of museums, churches, monasteries. Last, but not least, the lower income under the conditions of the pandemic, and at the same time the rising inflation, provide much limited opportunities for tourism and alternative forms of tourism are the adequate solution in this situation. The questioned tourists prefer this type of tourism to others, because they feel more protected and secure that they will avoid unnecessary contacts, and due to the feeling of being closer to nature and breathing clearer air.

Since March 2020 – the first lockdown, the National Statistical Institute (NSI) of Bulgaria conducts each month short business survey amongst businesses aiming to collect and present to the society and policy makers information on the economic effects from the declared state of emergency and the ensuing epidemic situation in the country due to COVID-19. The economic sectors included in the monthly surveys of NSI are: Industry, Construction, Wholesale and retail trade, Media & entertainment, Administrative services, Information and communication, Transportation and storage,

The breakdown by economic sectors showed that 54.0% of the companies in ', repair of household goods and other services had a **decrease in revenues** from sales of goods and services', followed by 'Wholesale and retail trade; transportation and storage; food service activities' with 48.6%. For the industry this share was 41.0% and for the 'Construction' - 46.6%.

As regards the employees, 15.0% from the responding enterprises answered that they had to use 'paid leave' as a measure for reducing the effects from the state of emergency and the epidemic situation, followed by 'Unpaid leave' - 14.9%, 'Home office' - 13.7% and 'government subsidies' - 9.9%.

Summary of the Coronavirus impact by economic sectors is provided in table2 bellow.

Table 2: Coronavirus Impact by economic sector

Categories affected by COVID – 19	Energy & Resorces	Healthcare &Life Science	HighTech and Telecommunication	Media and entertainment	Public sector	Retail	Manufacturing	Transportation and storage	Accomodation	Construction
Personnel	**4**	**2**	**2**	**3**	**4**	**5**	**5**	**5**	**5**	**4**
Operations	**4**	**5**	**4**	**5**	**2**	**4**	**5**	**5**	**5**	**4**
Supply Chain	**5**	**4**	**4**	**2**	**1**	**5**	**5**	**5**	**5**	**5**
Revenue	**4**	**4**	**2**	**3**	**3**	**5**	**5**	**5**	**5**	**4**
Overall impact assessment	**4**	**4**	**3**	**3**	**3**	**5**	**5**	**5**	**5**	**4**

Source: NSI quarterly reports on COVID-19 impact **1-minor impact; 2- moderate; 3-significant; 4-major; 5-severe**

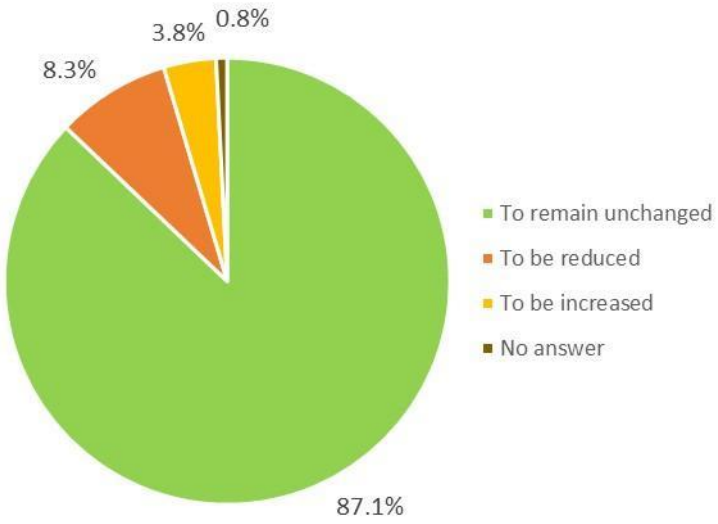
The good news is that more than 90% of the businesses expect that they will be able to continue their current activity, 2.5% expect to stop performing economic activity temporary and only 1.8% expect to close their business in 2022.

Employment and Income

The labor market is the first to feel the effects of the general decline in economic activity. The ban on certain activities during the state of emergency, combined with the closure of production facilities for various reasons (quarantine, delays in supplies, etc.) has resulted in shrinking employment and growing unemployment. Declining incomes and general insecurity lead to reduced individual consumption. In the second quarter of 2020, those employed in the economy numbered by almost 183,000 fewer than in the same period of 2019, or a drop of 5.6%. Quite logically, unemployment also went up, with the average unemployment rate reaching 5.9% in the second quarter, according to NSI data.

The economic sectors most strongly hit in terms of employment are hotels and restaurants, where the decline was by 68,000 people in the second quarter of 2020 compared to the same period of 2019. This is equivalent to 34.5% of all employees in the sector. In the manufacturing industry, which accounts for 19% of all employed in the economy, the decline is by 4.7%. The construction sector is also among the most affected sectors, where the employees are by 14.7% less.

Figure 2. Expectations about the number of employees in the enterprise in short-term period (1 month)



In the following months in 2022, 94.4% from the responding non-financial enterprises expect that they will be able to continue their current activity, 2.5% expect to stop performing economic activity temporary and 1.8% expect to close their business

New business models - away out of the crisis caused by the Coronavirus disease

According to a report ***Economic impact of COVID-19 pandemic: case of Bulgaria, Nikolay Sterev, (2021)*** a possible way out of the crisis for the companies is to introduce digitalization and innovation and to adequately support the entrepreneurship and the value chain.

Digitalization: The COVID - 19 pandemic has accelerated and encouraged the introduction of digital technologies by businesses in Bulgaria, but larger-scale digitalization processes have been hampered by insufficient staff qualifications and investment.

Innovations: There is need of investments in innovation infrastructure whether any single individual to have opportunity to prove its innovative idea. The innovation infrastructure could cover different start-ups and business incubators. Business incubators could serve as a link between uncertainty and innovations and these innovations will be more adapted to the needs of individuals and there is greater opportunity for launching new successful business models. In addition, economic growth will be push up by social growth via business incubators that could involve in growth trends such as population displacement, violence, youth marginalization, indifference, unemployment, etc. Furthermore, the business innovation support policy has to be designed to reduce the effect of the "Great Lockdown" on research productivity. Innovation policy has to be globally oriented, to support break-through innovators, to speed up the process of approving new patents and to target the more innovative individuals. The starting point of the innovation policy could be already reported structural breaks in innovation output across countries and different industries.

Entrepreneurship: Entrepreneurship is an instrument that prevent job loss in times of economic crises. Thus, there is need to enforce the entrepreneurial policy and to develop entrepreneurial support instruments. Some of the leading economies already enriched their entrepreneurial instruments that provide options countries to explore and to adopt them based on their respective country specific circumstances.

Value chain support: As an open economic system, the Bulgarian industrial production become more and more dependent by development of Global supply chains. So, the successful industrial policy that prevent negative effects of global crises needs to support not just global but domestic value chains as well. In this respect, industrial policy has to support projects for diversification of input sourcing including both domestic and international markets and "dual sourcing" of the same inputs from suppliers in different countries. Such approach should help preventing negative shocks through existing (single or limited number of) value chains. In cases like COVID-19, such support will provide exceptions of lockdown healthy policies for manufacturing and also will reduce the negative effects of lockdowns

As described earlier the COVID – 19 impact on the economy varies from region to region. The biggest difference is seen with the economy of the Capital City of Sofia.

COVID 19 effect on the economy of Sofia

There are several specifics of Sofia's economy that distinguish it from the structure of the economy in the rest of the country:

• Sofia's economy is a service economy. Services form over 80% of the city's economy.

• Greater commitment to the global and EU economies due to high exports

• Relatively small manufacturing sector

• The ICT sector produces nearly 19% of the city's economy, and together with the outsourcing industry is relatively less affected by the crisis

• Tourism, the sector that is among the most affected sectors, occupies a low share of Sofia's economy - about 2.5% (according to OP Tourism), but at the same time it employs about 4.5% of the city's workforce.

The information provided in the **Assessment Report on the Impact of COVID-19 on Sofia's Economy**, developed by the Digitization, Innovation and Economic Development Department of Sofia Municipality (Innovative Sofia) and the Sofia Municipal Privatization and Investment Agency (Invest Sofia) outlines the following key findings:

• Due to the large share of its service sector, Sofia's economy is relatively flexible and has the potential to adapt quickly to crisis situations. The ICT, outsourcing and trade sectors are likely to remain relatively less directly affected by the crisis in the short term.

• COVID-19 has a strong negative impact on the tourism and travel sector, as well as its related industries such as logistics and transport, entertainment and some cultural and creative industries subsectors.

• Sofia has the best demography and the most developed labor market in Bulgaria. According to the Institute for Market Economics (IME), the city is most likely to be able to adequately respond to the increased unemployment levels.

• There are over 650 000 people employed in Sofia. The IME team estimates that over 86 000 employees will be immediately affected by the crisis. The impact of COVID-19 on their incomes will depend on the sector they work in. Most affected will be those working in the tourism and travel sector (over 35 000 people), culture and sports (over 10 000 employees).

• Employment in the industrial sector will be moderately affected. Least directly affected in the short term will be those employed in ICT, outsourcing, utilities, and professional activities.

• In the context of social distancing, quarantine and self-isolation, the role of digitalization and the development and implementation of new solutions and e-services by the local administration will become even more crucial.

FINLAND

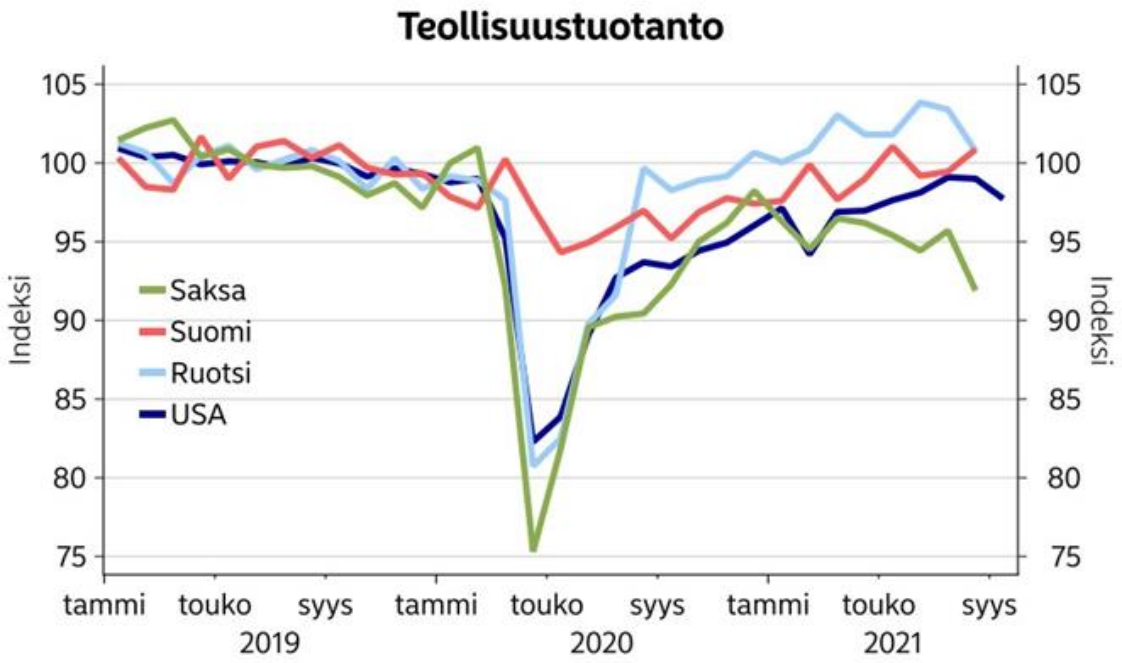
Impacts on the national economy

The pandemic escalated rapidly in the early part of the year 2020 and its effects were strong and far-reaching. On the other hand, the policy measures taken to mitigate the effects of the corona pandemic both globally, in the European Union and in Finland were unprecedented. Overall, the negative effects of the corona pandemic on the Finnish economy have so far been smaller than expected at the beginning of the year and smaller than the EU average. However, the pandemic is not over yet, and it will leave lasting marks on the Finnish economy as well. Some of the effects are more clearly visible. An example of this is the increase in public debt. However, some are more difficult to assess: how will the pandemic have a more lasting impact on the behavior of people and companies and the outlook for different industries?

Economic policy sought to mitigate the economic effects of the crisis in a number of ways. Government borrowing grew rapidly, and the monetary policy measures of central banks, e.g. through securities purchases increased. Among other things, the supervisory authorities will ensure that the credit facilities of the economy remain stable. The scale of the interventions was wide and the rate of recovery was exceptionally high.

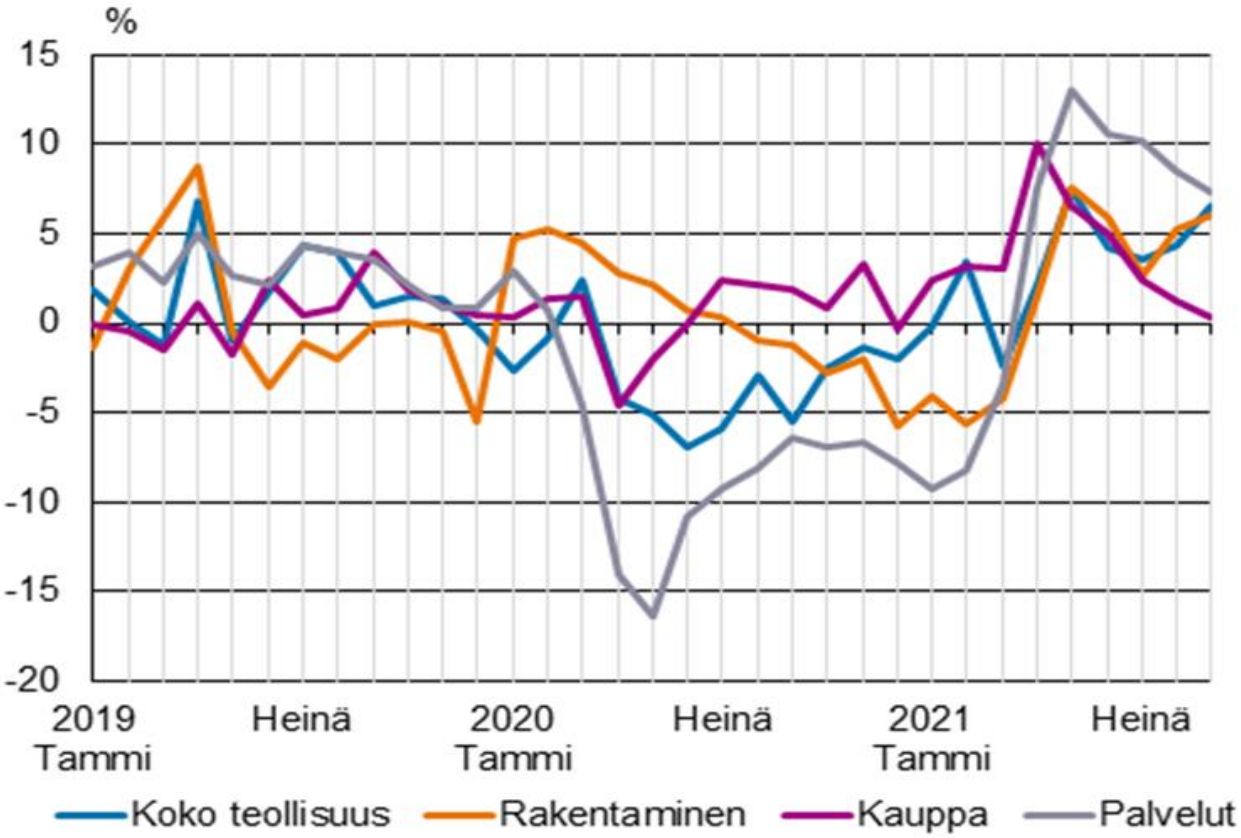
Industrial production in Finland remained ongoing even during the worst phases of the corona pandemic. This is one of the reasons why the economic effects of the corona have been smaller in Finland than in the comparison countries.

Industrial production (Germany/Green, Finland/Red, Sweden/light blue and USA/dark blue)



Trade in goods did not collapse at any point in the pandemic, but services accounted for 70 percent of the worst.

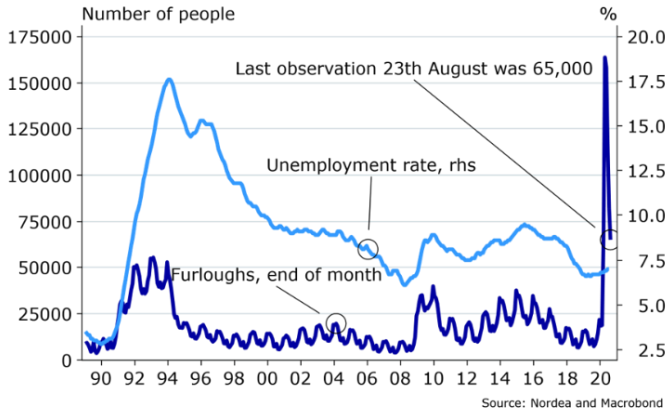
Annual change in working day adjusted output of industries (%)



Whole industry Construction Trade Services

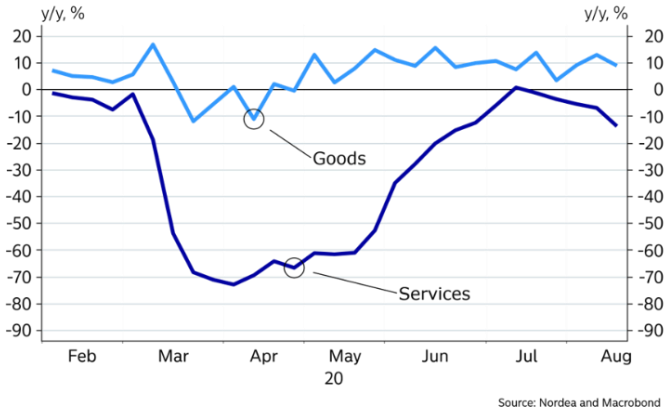
A / Number of furloughed down since spring

Number of people on furlough and the unemployment rate



B / Consumption has recovered

Nordea card data, card payments for goods and services

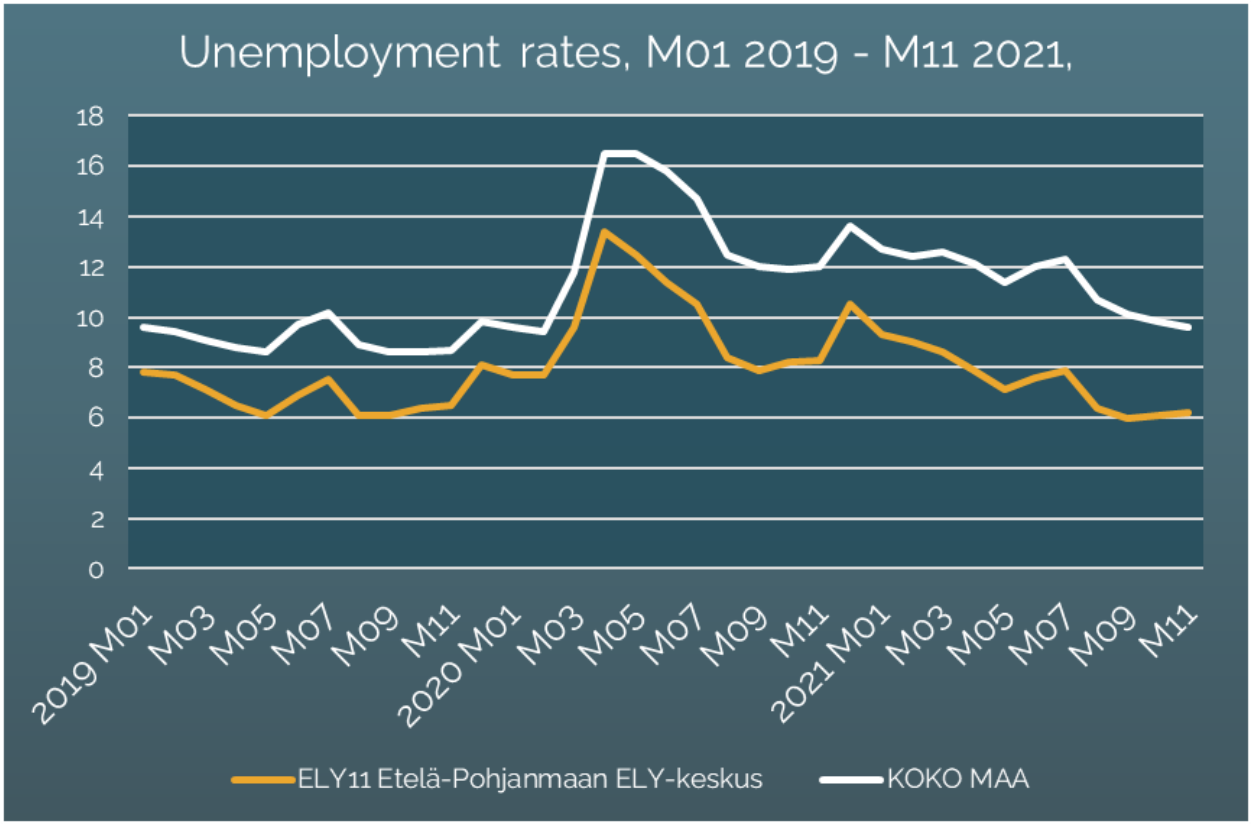


Impacts in South Ostrobothnian area

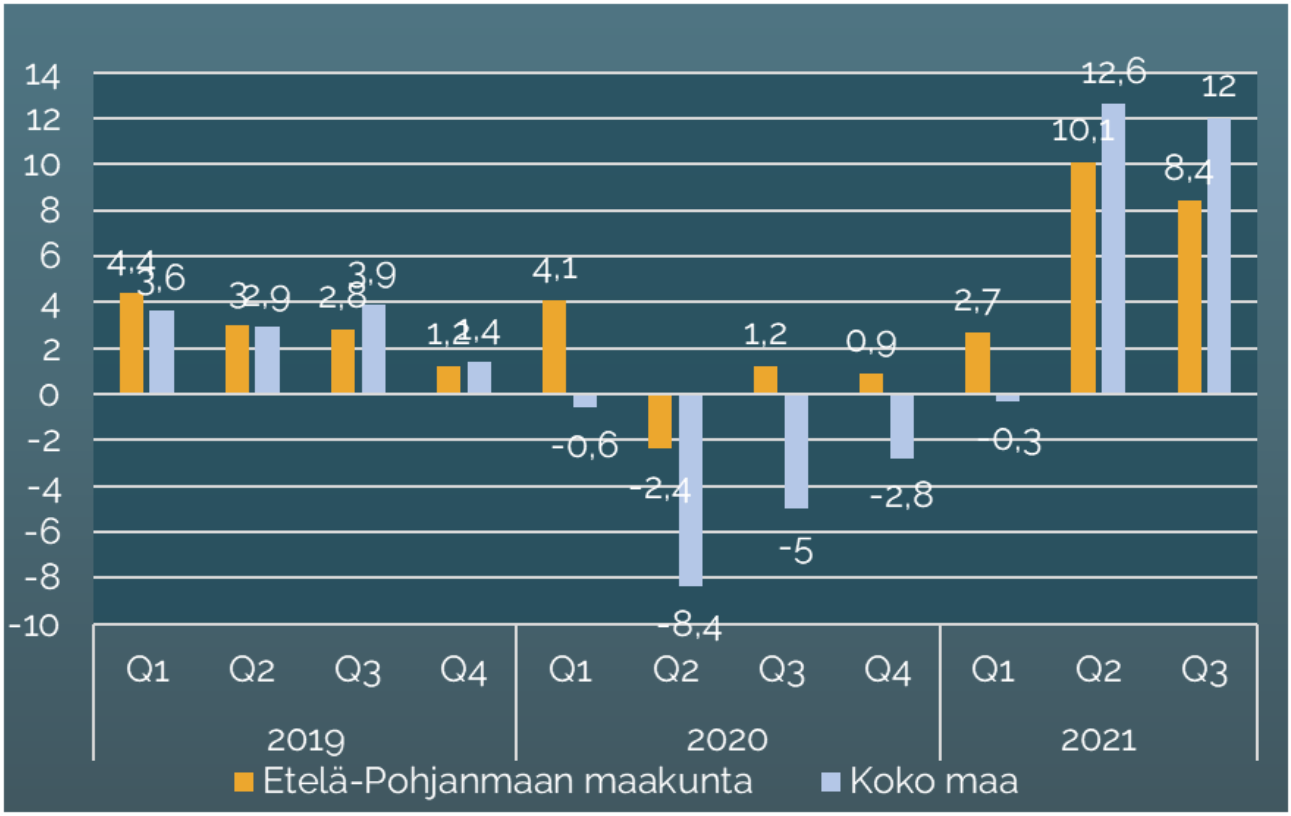
In Southern Ostrobothnia, the effects of the pandemic were greatest in the service sector. Small companies in the service sector, for example in the restaurants and tourism, have been the biggest victims throughout the pandemic. Passenger transport also decreased significantly in 2020.

In many other sectors, the decline remained really small and corporate turnover has been growing strongly. Industrial companies in particular have survived the effects of the pandemic with very little damage. Especially in 2021, industrial growth has continued strongly. The most significant industries in the region are the food, metal and wood industries. However, new growth-limiting factors have been brought about by the pandemic. Some industries have had difficulty obtaining certain materials and components from the global markets. In addition, the price of wood in Finland has risen sharply due to strong global demand. This also hurts local businesses. Another major regional problem is the supply of skilled labor, which has worsened in recent years. The aging of the population and the declining birth rate will pose a major challenge for businesses in the region in the future. Several measures are being taken to reduce this problem. Training, international recruitment and the increase in telecommuting have been seen as opportunities to find solutions to the problem. Unemployment rates are the lowest in Finland in the region, 3-7% depending on the municipality.

Yellow line: South Ostrobothnia, White line: Whole of Finland



Quarterly development of net sales in Southern Ostrobothnia and the whole country (all industries, Q1 2019 - Q3 2021) Yellow: South Ostrobothnia, Blue: Whole of Finland.



Outlook for the future

In the calculations, the prolongation of the epidemic is expected to affect Finland's economy, especially through private consumption and most significantly through the demand for services. It could result in long-term impacts on industry. The threat to the

continuity of the export industry operations connected to international markets and production chains will increase. Without international demand, the situation of companies continues to deteriorate. Due to obstacles to international cooperation, research, development and innovation activities also face challenges in the private and public sectors. The prolonged pandemic in Finland and globally will reduce private consumption of services. Tourism, culture and service sectors, including experience activities, may suffer major losses as consumers reduce any activities that may expose them to infections.

The coronavirus pandemic is further accelerating the digital transformation that was already underway before the pandemic. Commerce will become digitalised both in Finland and internationally with increasingly rapid and extensive leaps. There has been a considerably increase in the transport services and parcel deliveries of grocery and online shops, while many traditional brick-and-mortar shops have been abandoned. Saving time was considered a more significant reason for transitioning to shopping convenience goods online than the coronavirus pandemic. It has been estimated that by 2030, more than 20 percent, possibly up to 40 per cent of Finland's retailers will be lost. It has also been estimated that by 2030, the retail trade sector will lose around 11,000 to 25,000 jobs and the wholesale market will lose 5,000 jobs in Finland. The

above estimates were made before the coronavirus pandemic in spring 2020. The pandemic is expected to further accelerate the loss of jobs, especially in specialised and utility goods trade.

Pandemic is also an opportunity to accelerate the transition of the economic system towards carbon neutrality. The four key elements of the Sustainable Growth Programme for Finland will contribute to the renewal of the country's economic system in the 2020s. The key elements are: A green transition, digitalisation, raising the employment rate and competence level, and improving access to health and social services and increasing cost-effectiveness.

Industry outlook

The positive development of production has continued, but trade growth is slowing down.

Aggregate output of services has now reached pre-crown levels in the third quarter of 2019, but the arts, entertainment and recreation, accommodation and food service activities, and transport and storage, which suffered the most from the crown, are still well below pre-crown levels. In the other main industries, industry, trade and construction, production has continued to grow compared to the same period last year. However, the seasonally adjusted index describing the development of sales volume in trade has been declining in recent months.

In the third quarter of 2021, working day adjusted output in the service sector grew by 8.6 per cent year-on-year. The growth is due to a sharp drop in production caused by the coronavirus in the spring of 2020. Production increased in all main service industries. The largest increase in volume was in the accommodation and food service activities by 12.3 per cent. Professional, scientific and technical activities, on the other hand, increased their output by 10.6 per cent year-on-year in the third quarter.

In contrast, the working day adjusted volume of administrative and support service activities reached 8.9 per cent annual growth in the most recent quarter. According to the latest data, working day adjusted production in the frostbite sector has been growing steadily since April this year. Aggregate production has now reached the pre-crown level of the third quarter of 2019. However, a return to this level is still pending in some service sectors. The arts, entertainment and recreation, accommodation and food service activities and transport and storage, which suffered the most from the corona, are still clearly lower than before the corona.

In industry, working-day adjusted output grew by 4.9 per cent year-on-year in the third quarter of 2021. Growth was 11.3 per cent in the forest industry, 5.9 per cent in the metal industry and 1.1 per cent in the electrical and electronics industry compared to the third quarter of 2020. In the chemical industry, working day adjusted output decreased by 0.2 per cent compared to the third quarter of 2020.

The store's working day adjusted sales volume continued to grow in the third quarter of 2021. Working-day adjusted sales increased 1.3 percent from the third quarter of 2020. The quarterly change in the volume of trade-adjusted sales of the store was negative for the last time in the second quarter of 2020, but now growth has clearly slowed in the most recent quarter. Among the trade sectors, growth was recorded in the third quarter of 2021 in motor vehicle trade and repair, where working day adjusted sales grew by 3.8 per cent year-on-year, and retail trade, whose working day adjusted sales volume was 2.9 per cent higher than a year ago. The working day adjusted sales volume of wholesale trade decreased by 0.4 per cent year-on-year.

The working day adjusted sales volume of construction increased by 4.7 per cent year-on-year in the third quarter of 2021. The working day adjusted sales volume of total construction also increased in the second quarter of 2021, but decreased in the previous three quarters. Of the construction industries, sales volume increased in the third quarter of 2021 in building construction, 3.7 per cent year-on-year, and in specialized construction, 7.8 per cent year-on-year. The volume of sales in civil engineering began to decline, being 2.6 per cent lower than a year ago.

GREECE

General Description of impact at National level

The financial crisis caused by the pandemic found the enterprises at a time when they were still trying to recover from the previous ten-year financial crisis. As the pandemic crisis has had a negative impact on both the supply and demand side, it has further burdened a significant proportion of small and micro-enterprises, especially those that have for a long time suspended all or part of their operations. The government, during the initial outbreak of the pandemic and specifically in March-May 2020, took unprecedented measures to limit economic and social activity in order to limit the spread of the coronavirus to protect public health. At the same time, it adopted measures to support business and employment, in order to reduce the negative effects of the pandemic on the economy (IMEGSEVEE, 2021).

The Covid-19 pandemic has different effects when they are considered at industry level, due to the cessation of activity in certain sectors of economic activity, the transition to mass telework, the increase in demand for certain goods such as food, while the consumption of other goods fell abruptly (Economic Chamber of Greece, 2021).

Companies that represent 69% of the total turnover of Greek companies were directly affected by the pandemic of Covid-19 as a result of restrictions or even because of their shutdown. In total, companies that generate a turnover of € 32.9 billion (11% of total turnover) and employ approximately 1.1 million employees (25% of the total) have ceased their operation due to the pandemic. Gross National Product (GDP) was estimated to decline by 8.5% in 2020. The impact of the pandemic on tourism-related high value-added sectors of the economy, such as transport, accommodation and food services, will help reduce the GDP (Grant Thornton Greece, 2020).

In the long run, the pandemic may lead companies to change the geographical distribution of their business abroad. For example, multinational corporations may reconsider and possibly shrink their global value chains to protect themselves from supply chain disruptions. Alternatively, they could pursue geographical diversification to reduce site-related shock exposure and reduce costs to better cope with crises (Economic Chamber of Greece, 2021).

Impact at Regional level

According to a study, on the assessment of the effects of the coronavirus and health policy measures in the sectors of retail, industry, accommodation and food services of the region of Central Macedonia, assigned by the Regional Development Fund of Central Macedonia (RDFCM, https://rdfcm.gr/) to the Economic Chamber of Greece and implemented by a scientific team of the University of Macedonia (UoM, https://www.uom.gr/), the year 2020 was a year with huge impact on the economy due to the pandemic of Covid-19 (Economic Chamber of Greece, 2021).

The revenues of the first quarter of 2020 in the Retail Trade sector in the Region of Central Macedonia (RCM) showed the largest percentage increase on an annual basis during the period 2015-2020,

demonstrating a strong growth potential of the Retail Trade sector. Monthly income for January, February and March 2020 were the highest of all the corresponding months of the reporting period. The outbreak of the Covid-19 pandemic in mid-March and the consequent restriction measures, imposed by the government, not only abruptly suspended the momentum in the first three months of 2020, but also caused a significant reduction in the industry's turnover in the following three quarters of the year (Economic Chamber of Greece, 2021).

The Accommodation and Food services sector was severely affected by the Covid-19 pandemic, as the restrictive measures imposed to deal with the pandemic made it impossible for businesses to operate in the industry for a long time. The revenues of the sector recorded a dramatic decline in 2020, corresponding to less than half of the revenues of the previous year (Economic Chamber of Greece, 2021).

The industry shows resilience from the imposition of restrictive measures announced in March 2020 (lockdown and closing of the restaurants), as the first half of 2020 showed a relatively small drop of -4.21% compared to the corresponding half of the previous year. This observation and the data from which it emerges are strong evidence that the measures against Covid-19 ultimately had a negative, but not significant, impact on industry revenues. Also, the second half of the year of the pandemic shows a small increase in turnover of 0.52% compared to the corresponding half of the previous year (Economic Chamber of Greece, 2021).
According to a study by the Labor Institute of the General Confederation of Greek Workers (INE GSEE) on employees and jobs in the post-pandemic era, as captured by the Laboratory of Economic Geography of the Department of Geography of the University of the Aegean, 55,000 jobs were lost during the pandemic in Central Macedonia. The percentage of the population at risk of poverty in 2018 was 19%, while in 2020 it increased reaching almost 22%. A further increase in the rate is expected, according to the study, in 2021 as the suspension of economic activity has had a significant impact on many segments of the population, especially in the segments with low wages. But also, in the sectors where jobs are maintained, flexible forms of employment and low wages prevail. Equally low are the earnings of full and permanent employment (INE GSEE, 2021).

ITALY

The impact of the pandemic on the economic sector in Emilia-Romagna Region

The main factors that have led to economic spillovers due to the Covid pandemic can be summarized as follows:

-the closure or transformation of many activities due to the sudden contraction of demand following the pandemic (mainly for companies in the tourism, transport and cultural sectors);

-the temporary suspension of economic and productive activities as a result of government lockdown measures;

-changes in the organization of work through the massive recourse by companies of the so-called smart working that provides, where possible, the execution of the work activities of employees in their homes.

In the Emilia Romagna Region, the 2020 year represents the end of a positive economic cycle (from 2014 to 2019), as described above. Almost all economic sectors have been damaged by the COVID 19 pandemic crisis, although with different intensities. Generally speaking, the categories most affected, especially during lockdown periods, were businesses for some manufacturing sectors, the retail except for the food sector, food service sector (i.e. bar, restaurants, fast food), the sports and the tourism facilities. Therefore, the pandemic period had an asymmetrical effect on the different sectors of the economy: while many decreased income and employment in 2020, others experienced growth or consolidation.

In fact, sectors such as high-tech sectors (such as ICT, pharmaceuticals, biomedical) may have experienced lower economic losses or, in some cases, may have had an expansion of the market opportunities. Some companies, in order to cope with the crisis, have converted their production process to produce medical devices such as covid masks or alcohol-based disinfectants.

At the regional level, the data of the surveys carried out show that the economic crisis began in March 2020, due to the first lockdown period and the closure of the enterprises and the business activities, but it was accentuated during the second quarter, restarting a little bit during the summer period.

The industry sector contracted for the first quarter of the year, which intensified in the second quarter and continued in the third and fourth quarters (but with a containment of losses). On an annual basis, in 2020 the decrease in production was equal to 10,4% compared to the previous year.

As far as the construction sector is concerned the first two quarters of the year were characterized by a negative change and a recovery during the third and fourth quarters, which made it possible to close the year with a contraction of around -6,3% on an annual basis.

The retail trade has seen a first trend contraction in the first three months of the year and an aggravation during the second and fourth quarters, helping to close the year to the sector with a variation of -6.7% compared to 2019. The decrease of revenues was more intense for the retail (non-food) trade and for the smaller activities.

In 2020 a focus on the regional trade sector[5] allowed us to see that the balance between job positions created and loss was negative by (more than 2.300) compared to the positive balance (about 1.670) recorded in 2019. With regard to trade as a whole, a study estimates a loss of just over 1,3 billion euros in added value for 2020 compared to 2019 and a contraction of about 26 thousand jobs.

Looking also at the trend of trade flows with foreign countries, the Emilia-Romagna Region had overall negative impacts in 2020.

Some studies on the economic performances of green companies show that they have been more resilient in this period of economic crisis.

An Italian report[6] shows that 2020 for the green economy is confirmed as a year of consolidation, despite the general economic difficulties that have distinguished it. At the end of the year the employees who carry out a green profession jobs amounted to 3.141,4 thousand units, an important share that sees a consolidation compared to the previous year (3.132 thousand units) despite the adverse effects of the pandemic on the economy.

The employed who carry out a green job profession in 2020 were 13,7% of the total Italian employees. Going to analyze the regional situation, Emilia Romagna exceeds the national average with 15,6% of green employment on the total.

The impact of the pandemic on the economic sector in the Metropolitan City of Bologna according to the data of the Chamber of Commerce of Bologna (Available data: March 2021)

The Chamber of Commerce of Bologna, presents data about the impact of pandemic on economic sector, updated to March 2021.[7]

Considering that the Chamber of Commerce processed data of the first three months of 2021, updated in March and that the ones processed by Metropolitan City of Bologna, cited in the previous paragraph, are about the year 2020, updated in December, some differences are evident, showing, in some cases, a positive trend in the first months of 2021.

The impact of the pandemic on the number of enterprises

The Bolognese companies in March 2021 are 118.153. They are: 94.663 companies based in Bologna and 23.490 local units, of which 9.072 are enterprises located outside Bologna. In the first three months of the year 2021, 1629 companies started the business, about 18 every day.

[5] ART-ER, Commercio e mercato del lavoro in Emilia-Romagna, November 2021

[6] Symbola ,Greenitaly 2021

[7] All the data cited are available on www.bo.camcom.gov.it/it/blog/bologna-i-numeri-dell%E2%80%99inizio-della-ripresa.

Compared to the end of March 2020, when the economic cycle was related to a 2019 that showed signs of difficulty since the middle of the year, there were 180 registrations more.

The first quarter of 2021 recorded 1/3 openings less than 10 years ago. About 1700 companies closed, 407 less than in March 2020, 20% less than in 2011.

The individual firms mainly pay the bill of the pandemic with the closure of the activity (6 out of 10 closures). On the other hand, the growth of capital companies continues strong: +162 between January and March. In detail by sector: agriculture has lost 80 businesses in the three months, manufacturing lost 42, services lost 100. There are also 100 artisans less.

The following sectors show a positive growth in terms of numbers of enterprises: buildings, real estate activities, and also accommodation and restaurant business.

The impact of the pandemic on the economic trend in the main sectors

Manufacturing: almost all manufacturing data are positive. It is the first time since 2019.

The prevailing trend is that of a marked rebound. The production has substantially recovered the levels of the weeks before the outbreak of the pandemic. The orders are in increasing of 1,4%, thanks, above all, to those coming from abroad, +3,5%; the turnover is increased of 2%, the foreign one of +0,5%.

The mechanical companies have a positive trend slightly higher than the average trend of the manufacturing sector: the turnover, the orders and the demand from abroad have values around + 3% (all values were between -9% and - 12% at the end of 2020). The turnover from abroad, after the closure of year 2020 with a decline of over 12%, recorded in the first three months of 2021 -0,8%.

The packaging seems to recover, at least partially, a difficult 2020, which was preceded by a 2019 already in decline. At the end of March 2021: +3,8% in production levels; +12,4% for turnover, +5,7% in orders. Confirmations of confidence come from foreign markets: +12,3% compared to March 2020 for exports, +8.4% in orders from abroad.

The manufacturing handicraft has not yet recovered completely the levels of production that are -1,8%, the orders are -1,9% and the turnover is -0,9%. There is still difficulty also in the foreign markets with a decrease of -9,4% in the turnover and -7,3% in the orders from abroad.

The cooperation records on the one hand a not complete recovery of production, -0,7%, and turnover levels, -1,7%; on the other hand, there are good signals from foreign markets with +4,7% in exports and +0,9% in demand from abroad.

In the buildings sector, the turnover is broadly in line with the end of March 2020, the cooperative part is recovering (+2,1%).

The alimentary manufacturing records difficulties with production and turnover (-5%), the orders (-1,5%) and almost null variations on the foreign markets.

The services have an average loss, in the first three months of 2021, of an additional 4,8% in turnover. Bending of the -3% for the sales of the retail trade with -5% in the alimentary section and -2,4% in not alimentary.
After the endurance favored by the lockdown, the large scale distribution also slows down: -3%. Tourism activities lost in the first three months of 2021, compared to the same period of 2020, over a third of the turnover, -37.3%: -34.9% the turnover of accommodation; -36.8% for catering; for travel agencies the losses are close to two-thirds of turnover (-67.3%).

The impact of the pandemic on export
The value of Bolognese exports in the first three months of 2021 is over 4 billion euros, with a recovery, compared to March 2020, of +6,7%, a better value than the regional average growth of +6,1%, and the Italian one: +4,6%.
In absolute value, it is a better performance also regarding how much was recorded in period pre-covid, in March 2019, when the exports had stopped to little more than 3,7 billion euros, with a variation of +6,5%.
Imports also increased significantly: +9%, an important sign, considering that the Bolognese manufactory operates on the processing of raw materials and semi-finished products.

In the Emilia-Romagna region the increase of the imports was bigger, settling itself to +12,4%, in Italy the purchases from foreign countries in course of year arrive instead to +5,8%.

Manufacturing, which determines 99% of Bologna's exports, recorded an increase in sales abroad of +6,3%.

In detail: foreign sales of mechanical engineering recovered by 6,8% of the value, where only the computer, electronic and optical equipment sector remained negative (-3%). Positive signs for means of transport, +6,1%, and machinery, +5,2%. Important growth for electrical appliances (+14,9%) and for metals and metal products (+18,3%). The sales of food, beverages and tobacco (+7,3%) and those of pharmaceuticals (+19,4%) are positive, the foreign sales of clothing products restart (+1,4%). Concerning the countries of destination: Germany remains the main destination and grows by 11,6% compared to March 2020. The exports in the United States, +3,5%, and in France, +11% are recovering. The sales in the UK are decreasing -8.9%. The sales to Japan remain growing, +6.7%. It is very high the growth of the +54.3% of sales to China, favored by +110% of transport vehicles, which represent a third of Bolognese sales in the Chinese territory.

The investment on environmental sustainability
In the year 2020 the 20% of enterprises invested in environmental sustainability.

The 61% of the investment was in reducing energy costs, the 21% was in implementation of waste recycling, the 15% was in reduction of CO2 emissions, the 1% was in reduction of water pollution.

3. Impact of the pandemic on the environmental sector

BULGARIA

Impact of the pandemic on environmental sector is seen in the following areas: green gas emissions, air quality, energy consumption, waste. Data and information from studies and surveys on air quality, transport (in relation to home travel - work), energy consumption; data on waste are available for 2020.

Main source of information for this chapter are the statistics of National Statistical Institute (NSI) and Executive Environmental Agency at the Ministry of Environment and Water. Annex 1 of this report contains excel files with data on waste generation and air pollution for 2020 as published by the National Statistical Institute.

Greenhouse gas emissions: short-term benefits and lessons for the future

In addition to affecting people's lives, the COVID crisis is having a direct impact on energy use and greenhouse gas (GHG) emissions at national level. Due to the effect of COVID-19 on the economy, in 2020 there was unparalleled reduction in GHG emissions in Bulgaria compared to 2019. To fully quantify its magnitude after 2020 more data are needed.

The transport sector, a key source of GHG, is particularly affected by the crisis. The demand for passenger transport has declined as a result of international travel restrictions and reduced commuting, tourism and business travel. According to data released by NSI in 2021 a 57 % decline in turnover from road passenger transport activity is observed in Bulgaria for 2020 compared to the previous year. For air transport, figures from the International Air Transport Association (IATA) show a 65.2 % drop in air passenger kilometers in Europe for the year-to-date ending July compared to the same period in 2019. These figures point to a significant decline in GHG emissions from transport in 2020.

According to initial evaluations from the Energy Agency, global energy demand in 2020 went down by around 6 %. While the short-term reductions in energy use and emissions may make 2020 targets achievable, any longer-term goals will require political decisions that prioritize recovery measures which contribute significantly to climate change mitigation. Clearly, the transition of the energy and mobility systems must accelerate if we are to achieve climate neutrality by 2050.

This is still expressed as an ambition by the policy makers, but the real measures/actions are to come.

Air quality, noise and (un)healthy environments

One of the most evident short-term effects of COVID-19 lockdowns has been the dramatic improvement in air quality, especially in the capital city of Sofia. Currently air quality levels appear to be returning to near-pre-lockdown levels in the larger Bulgarian cities after the lockdown measures in 2020 are lifted, this period has revealed some of the benefits that could be achieved from a lasting and sustainable reduction in air pollution.

The EEA's Air quality and COVID-19 viewer tracks average weekly and monthly concentrations of nitrogen dioxide (NO) and particulate matter (PM). Data show how concentrations of NO — a pollutant mainly

emitted by road transport — fell sharply in Bulgaria where lockdown measures were implemented in the spring of 2020.

Concentrations of PM also fell across Bulgaria in this period, but decreases were less pronounced. Whereas NO emissions are largely attributable to road transport, PM concentrations are influenced by emissions from natural sources as well as man-made sources such as residential heating, agriculture and industry, which have been affected by lockdown restrictions to a lesser extent.

The extent of reductions varied considerably, with the largest reductions of up to 70 % seen in Sofia city. With the economic activity returning in 2021 the initial decline in NO, is now followed by a return to pre-lockdown levels.

Plastics, waste and recycling

The COVID-19 pandemic has caused significant changes in the production and consumption of plastics, and in plastic waste. T e pandemic led to a sudden surge in global demand for personal protective equipment (PPE), such as masks, gloves, gowns, bottled hand sanitiser, etc.

Since most restaurants in the large cities of Bulgaria were closed for on-site dining, many moved to offering take away and delivery services using single - use plastic containers. Several large coffee retailers stopped allowing customers to bring refillable containers, using disposable cups in their place. Meanwhile, online shopping outlets have seen a surge in demand, with many products packed in single-use plastic.

While disposable plastic products have played an important role in preventing the spread of COVID-19,
In the shorter term, the upsurge in demand for these items may challenge the efforts in the country to curb plastic pollution and move towards a more sustainable and circular plastics system. The production, consumption and disposal of additional single-use plastics will have had a greater impact on the environment and climate, such as increased air pollution and greenhouse gas emissions, waste generation and risk of littering.

In addition to the direct effects stemming from increased demand for single-use plastics, other factors related to the pandemic should also be noted. Reduced economic activity has seen sharp falls in global oil prices. In turn, this has made it significantly cheaper for manufacturers to produce plastic goods from virgin, fossil-based materials rather than using recycled plastic materials. The economic viability of the European and global plastics recycling market is presently under significant pressure.

Lower market demand for recycled plastics has also complicated the efforts of many Bulgarian municipalities to manage their waste practices sustainably, with less desirable waste-disposal methods now being required for significant quantities of plastic waste.

The pandemic also has negative consequences for the environment, the most visible of which is the increased use of single-use plastics. This fact proves that efforts must focus not only on controlling the virus, but also on changes in production and consumption systems.

According to the statistics the plastic waste increased with 40% for 2020 compared to 2019 in Bulgaria. The cardboard and paper waste are 50% higher for the same period and the health care and biological wastes increased with 70%.

Crisis like COVID-19 underline the importance of implying measures to protect the environment and against climate change.

It is obvious that:

• The health and development of human society depends on the introduction of a sustainable system of protection and restoration of the environment.

• The extinction of plant and animal species (loss of biodiversity) and the resource-depleting food industry make new zoonotic diseases more likely.

• Poor air quality contributes to the spread of Covid-19.

• Increased dependence on single-use plastics and low oil prices (as a result of travel restrictions) has negative consequences for the environment.

FINLAND

Clear statistical data about the impact of the pandemic on the environment is not available, but some estimations were tried to be made about the amount of waste produced by households during the pandemic as well as about the changes in traffic.

The data about increased production of waste of households was collected from two waste-managing companies Lakeuden Etappi and RINKI Ltd. Data about traffic was received from the Center for Economic Development, Environment and Transport.

Generally, it seems that the environmental effects, both the positive and negative remained rather small and temporary during the pandemic.

Packaging waste - Perspectives from Finnish Packaging Recycling RINKI Ltd
At the moment there are no official statistical data about packaging waste from 2020 or 2021. It is estimated that the official data of 2020 will be released sometime in Spring 2022.

The CESME project partners contacted the Finnish Packaging Recycling RINKI Ltd. about the packaging waste collected by them and received some indicative data. RINKI Ltd. is a nation-wide packaging recycling company that has more than 1850 take-back points across Finland.

According to their statistics the amount of packaging waste collected in Finland has grown with 16 % from 2019 to 2020 including packaging categories (plastics, cardboard, glass and metal). In 2021 the growth has slowed down, but the collection of cardboard waste has continued to grow substantially. Here the effect of increased online shopping is relevant.

In South Ostrobothnia the amount of collected packaging waste through RINKI's take-back points has grown also from 2019 to 2021. It is however difficult to state whether the impact has been solely the pandemic or other factors.

Collection of packaging waste in South Ostrobothnia	**2019**	**2020**	**2021**
Collected packaging waste (tons)	2 069	2 131	2 312
Collected packaging waste (%-change)		3 %	8 %

Municipal waste management - perspectives from Lakeuden Etappi
Lakeuden Etappi is a municipal waste management company operating in South Ostrobothnia. They offer waste-management in 8 municipalities in the region.

During 2020 the visits at the recycling points owned by Lakeuden Etappi grew with 15 percent as households spent more time at homes and started to renovate and rearrange their houses. This reflected also to the amount of waste brought to the recycling points.

The amount of combustible waste grew with 19 % and the amount of recyclable waste (such as metal, wood, concrete, home appliance and gardening waste) grew with 17 percent. The amount of hazardous waste grew also with 29 percent.

The increase in the amount of waste recycled does not however mean that households started to create as much more waste, but also that households had more time to go through materials stored in their houses. In 2021 the visits as well as the amount of waste has lowered down.

Research on combustible waste at Lakeuden Etappi

In 2021 Lakeuden Etappi made a waste analysis of the collected combustible waste from households. In general, 93,8 % of the produce sorted as combustible waste was usable for the energy production, which was 3,3 %-points less than in 2019 (97,1 %). The amount of packaging waste, such as cardboard, metals, plastics and glass, grew especially in the combustible waste to 37,4 % which is 4 %-points more from 2019.

Some Covid-19 impacts can be seen here. As people consumed more time at home, there was also more packaging waste coming from online shopping and take-away food. The packaging waste recycling points in Finland, and especially in South Ostrobothnia, are usually located next to supermarkets or other central locations. As the number of trips outside home decreased during the pandemic, it might have impacted to the willingness to sort out packaging waste at homes.

Despite these factors caused by the pandemic, there is however a clear need to improve the sorting out of packaging waste in households. Positive in the analysis was however that the amount of biowaste put into combustible waste was reduced to 26,1 % from 31 % in 2019. This concludes that household have improved in the sorting of biowaste.

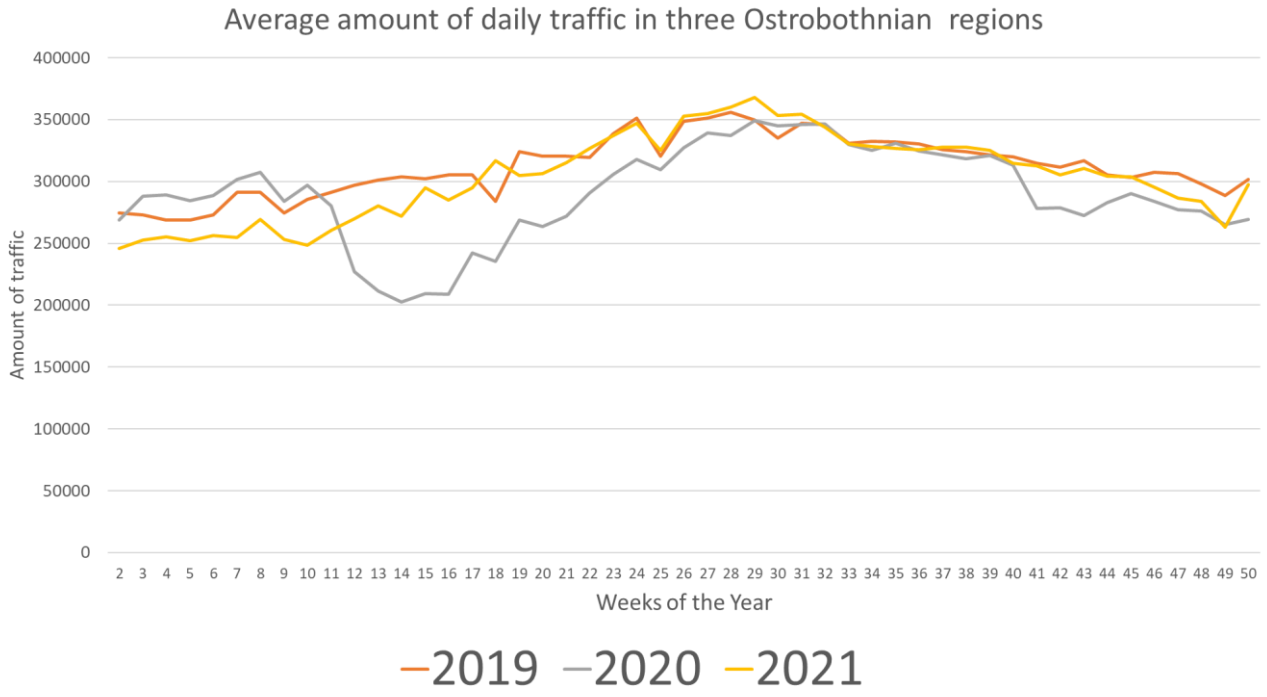
New waste-management law

In 2021 the new waste-management law came into force in Finland, bringing more obligations to recycle packaging waste in housing associations. The new law has also impacted in the changes of recycling in households. For example, every housing association with over 5 houses is obliged to organize a biowaste sorting by July 2022, and packaging waste sorting by 2023.

Changes in the traffic

Based on the data received it seems that the pandemic did not have any substantial effect on the traffic in South Ostrobothnia and through that to the emissions caused by the traffic.

Based on the traffic analysis received from the ELY-center (see the paragraph) only during the most severe lock-down time that lasted three months from March 2020 to May 2020 (weeks 9-17) the traffic decreased to one third of normal. But after that the traffic has returned to the normal. After all, in 2020 the traffic decreased only with 7 % to 2019 and in 2021 the amount of traffic was only 3 %.



Research - Effects of remote work to greenhouse emissions of traffic

In September the Prime Minister's office in Finland released a publication about the effects of the remote work to greenhouse emissions of traffic in Finland. According to the study the effects on the traffic and the emissions are rather moderate, but still important step in Finland's way towards fossil free traffic. In 2019 15 % of working people made remote work regularly in Finland. In 2020 the amount rose to 35 %. The study estimates that in the becoming decades the amount will be about 24 %.

With these shifts towards remote work is estimated that by 2030 the gashouse emissions of the traffic with 0,125 megatons.

GREECE

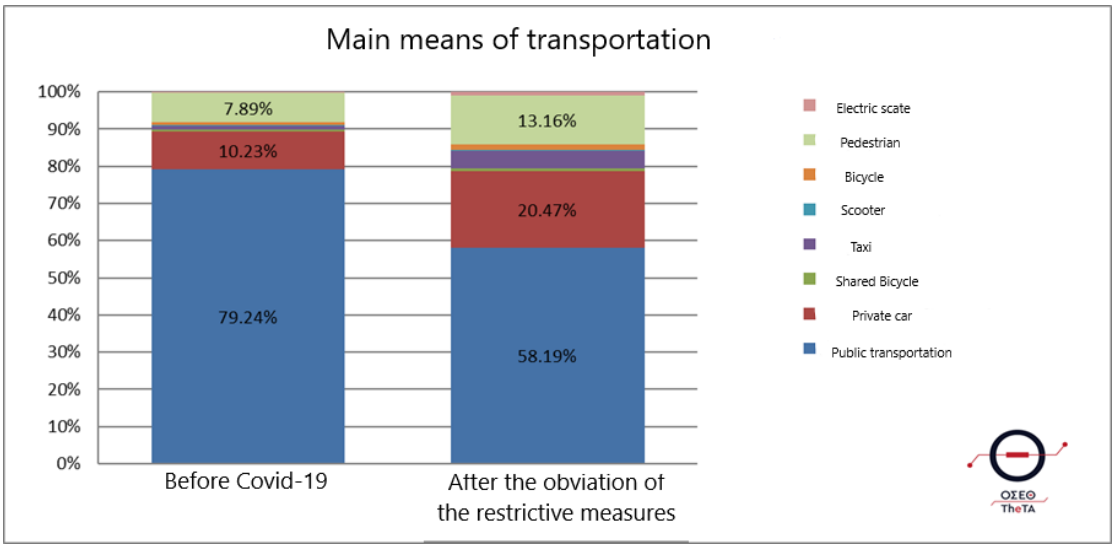
According to European Environment Agency (EEA), the COVID-19 pandemic has had a significant impact on people's lives worldwide. Furthermore, the pandemic highlighted the following facts (European Environment Agency, 2020):

- The COVID-19 further highlights the interrelations between our natural and societal systems: societal resilience depends on a resilient environmental support system.
- Biodiversity loss and intensive food systems make zoonotic diseases more likely.
- Often related to social inequalities, environmental factors such as air quality appear to influence COVID-19 outcomes.
- Increased reliance on single-use plastics and low oil prices resulting from lockdowns have negative consequences.
- Lockdowns during the COVID-19 pandemic may have some direct, short-term, positive impacts on our environment, especially in terms of emissions and air quality, although these are likely to be temporary.

In 2015, the United Nations adopted 17 Sustainable Development Goals (SDGs) with the view to improve livelihood and the natural world by 2030, making all countries of the world sign up to it. To succeed, the foundations of the SDGs were premised on two massive assumptions namely globalization and sustained economic growth. However, COVID-19 has significantly hampered this assumption due to several factors. Indeed, COVID-19 has brought to the fore the fact that the SDGs as currently designed are not resilient to shocks imposed by pandemics. Prior to COVID-19, progress across the SDGs was slow. It is reported that two-thirds of the 169 targets will not be accomplished by 2030 and some may become counterproductive because they are either under threat due to this pandemic or not in a position to mitigate associated impacts (Naidoo & Fisher, 2020).

In the summer of 2020, a Survey was conducted by the Transport Project Organization of Thessaloniki S.A. with the aim of an indicative record of the effects of the pandemic on the range of daily movements of citizens with public transport in Thessaloniki. The research was carried out both electronically and with interviews at key points and transfer stations in Thessaloniki. A total of about 350 people took part in it, a small but indicative sample of the behavior before and after the restrictive measures due to the coronavirus. Some results are: One out of four passengers changed their way of moving due to the pandemic after the phasing out of the restrictive measures. At the same time, the daily use of public transport decreased by 21 whole percentage points, while the use of private cars increased by 10 percentage points (mainly from users who used public transport in the past). In fact, one out of ten respondents stated that "he would no longer use public transport" (Thessaloniki Transportation Project Organization, 2020).

Image 2: Choices in the means of transportation (Thessaloniki Transportation Project Organization, 2020)



Positive impact of COVID-19

Despite the many harmful effects, COVID-19 has provoked some natural changes in behavior and attitudes with positive influences on the planet. Nonetheless, to the extent that the trends discussed below were imposed by the pandemic, they also underscore a growing momentum for transforming business operations and production towards the ideal of the Circular Economy (CE) (Ibn-Mohammed et al., 2021). The following positive impact is recorded:

- Improvements in air quality
- Reduction in environmental noise
- Increased cleanliness of beaches
- Decline in primary energy use
- Record low CO_2 emissions
- Boost in digitalization

The changes are not due to the right decisions from governments in terms of climate breakdown policies and therefore should not be misconstrued as a climate triumph.

As regards the digitalization of SMEs and their environmental footprint of the EU-27 SMEs that participated in the 2020 Flash Eurobarometer 486 survey, 37% (after excluding the “not applicable” and “don’t know” responses) have already implemented an environmental sustainability plan or are in the process of doing so. National SME associations and SME digitalization support organizations highlighted simple actions, such as the use of ICT tools (e.g. videoconferencing as alternatives to travel), and the use of smart appliances to control/reduce energy consumption as useful digital tools to improve the sustainability of SMEs. However, SMEs face a number of barriers in making their businesses more sustainable, with 70% of EU-27 SMEs encountering at least one of the barriers to sustainability covered in the Eurobarometer survey. The most frequently reported barrier was “lack of consumer or customer demand” (30%), followed by “lack of financial resources” (27%) (CARSA et al., 2021).

The change in atmospheric pollution from a public lockdown in Greece introduced to curb the spread of the COVID-19. According to a study which was based on ground-based and satellite observations the change in atmospheric pollution in most cases is not statistically significant. It is probably an artifact of

the meteorological conditions that contributed significantly to the long-range transport of air pollutants over Greece during the shutdown period (Varotsos et al., 2021).

Negative impact of COVID-19

The COVID-19 pandemic has caused significant changes in the production and consumption of plastics, and in plastic waste. The pandemic led to a sudden surge in global demand for personal protective equipment (PPE), such as masks, gloves, gowns, bottled hand sanitiser, etc (European Environment Agency, 2020).

The pandemic has unleashed a wave of plastic trash on Greece and the world, raising all sorts of new waste management challenges. Self-testing kits are part of Greeks' day-to-day lives right now, a key element of the campaign to restart economic and social activities, but their instructions do not include information on how to dispose of them safely after they've been used. Apart from their plastic wrappers and components, these kits also contain octyl/nonylphenol ethoxylates, which are defined as substances of very high concern (SVHC). Petros Samaras, a professor of science and food technology at the International Hellenic University (IHU) and Aristotle University of Thessaloniki environmental engineer Yannis N. Krestenitis recently presented a proposal in which they argue that self-testing kits must be disposed of in the same way as unused or expired medicines, which are returned to pharmacies, placed in a special green locker and then sent for incineration. They warn that any other disposal method poses a public health and environment hazard (Elafros, 2021).

Based on WHO modelling, an estimated 89 million medical masks are required for the COVID-19 response each month. For examination gloves, that figure goes up to 76 million, while international demand for goggles stands at 1.6 million per month (World Health Organization, 2020).

Since most restaurants in Europe were closed for on-site dining, many moved to offering take away and delivery services using single - use plastic containers. Several large coffee retailers stopped allowing customers to bring refillable containers, using disposable cups in their place. Meanwhile, online shopping outlets have seen a surge in demand, with many products packed in single-use plastic (European Environment Agency, 2020).

While disposable plastic products have played an important role in preventing the spread of COVID-19, in the shorter term, the upsurge in demand for these items may challenge EU efforts to curb plastic pollution and move towards a more sustainable and circular plastics system. The production, consumption and disposal of additional single-use plastics will have had a greater impact on the environment and climate, such as increased air pollution and greenhouse gas emissions, waste generation and risk of littering (European Environment Agency, 2020).

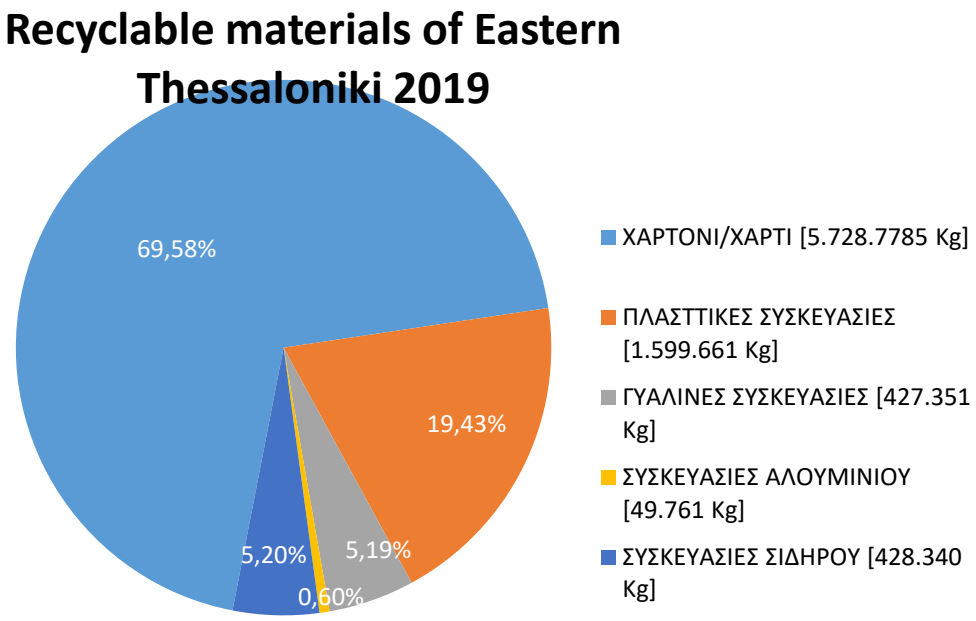
In addition to the direct effects stemming from increased demand for single-use plastics, other factors related to the pandemic should also be noted. Reduced economic activity has seen sharp falls in global oil prices. In turn, this has made it significantly cheaper for manufacturers to produce plastic goods from virgin, fossil-based materials rather than using recycled plastic materials. The economic viability of the European and global plastics recycling market is presently under significant pressure. Lower market demand for recycled plastics has also complicated the efforts of many of Europe's local municipalities to

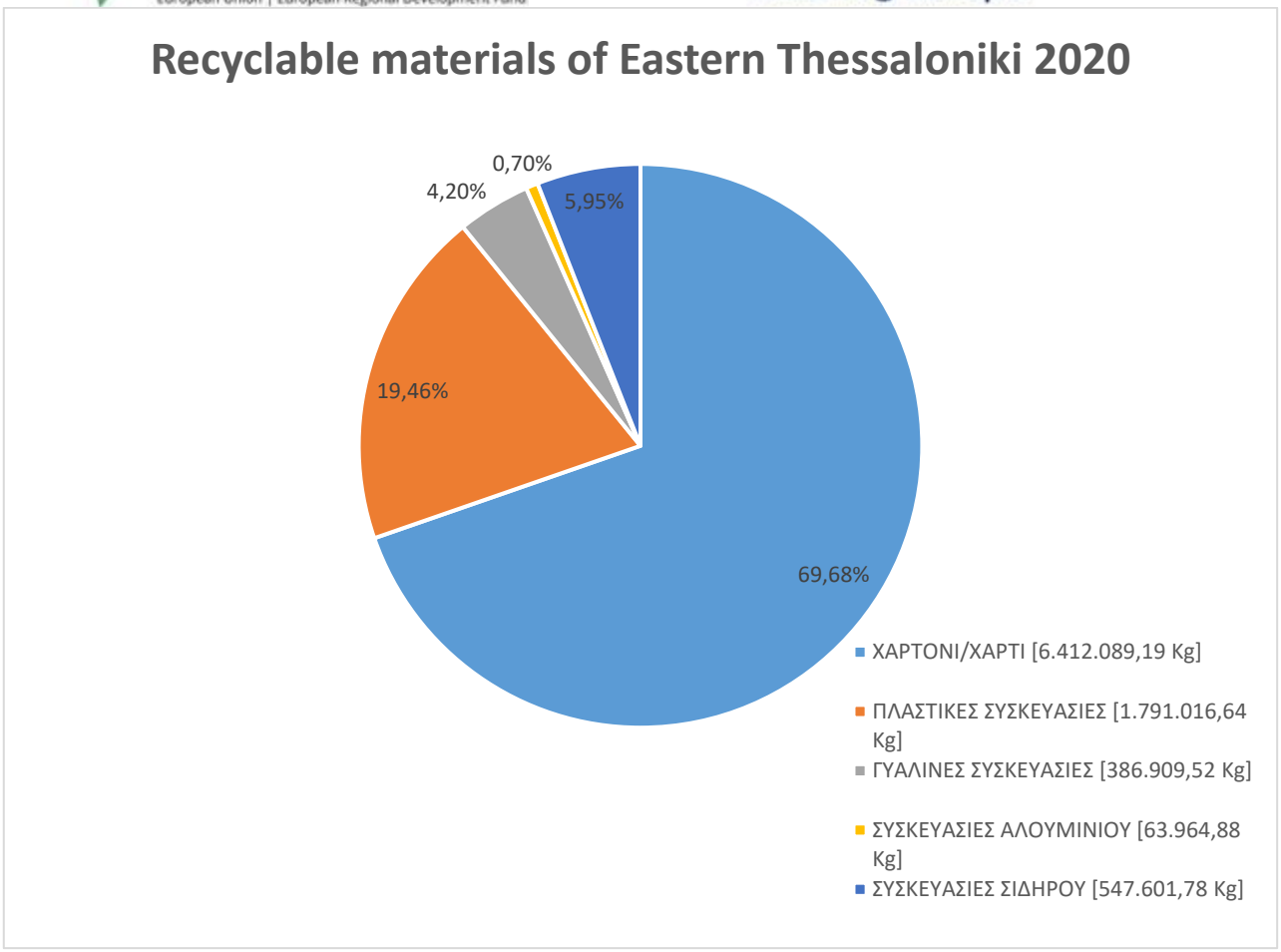
manage their waste practices sustainably, with less desirable waste-disposal methods now being required for significant quantities of plastic waste (European Environment Agency, 2020).

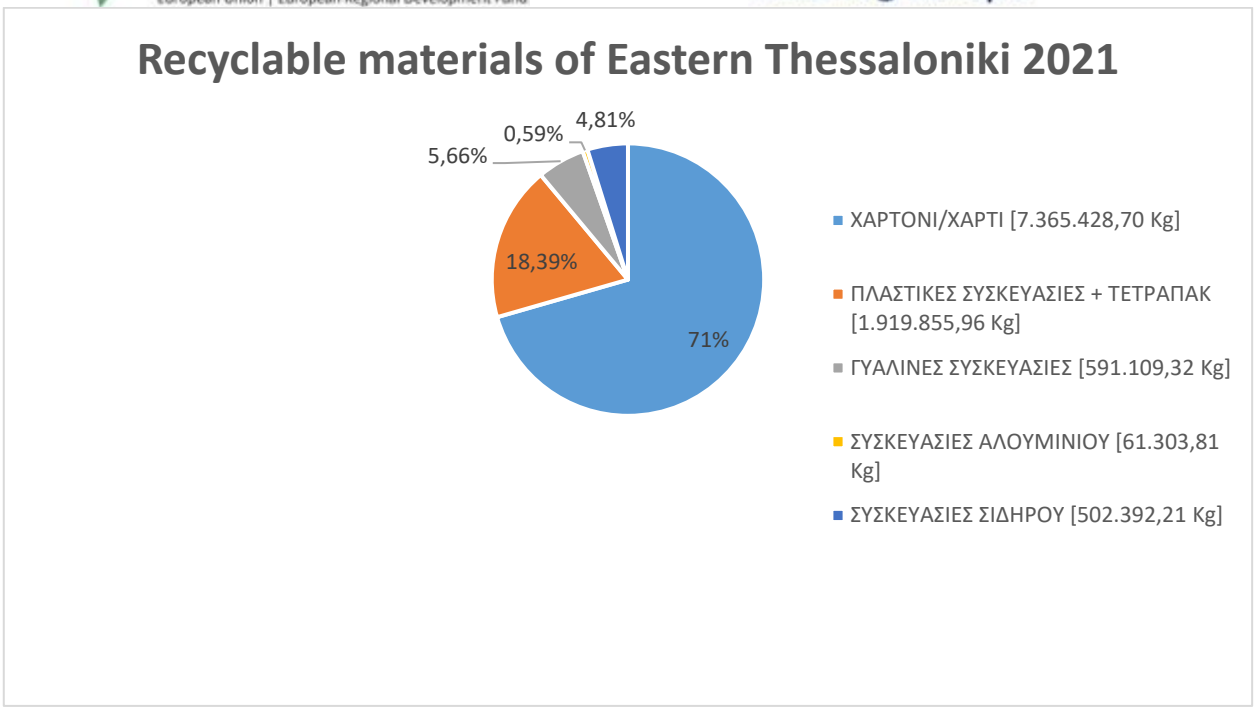
Assortment of the recyclable materials of Eastern Thessaloniki

In the following 3 diagrams, the quantities of certain categories of recyclable materials in the municipalities of Eastern Thessaloniki are displayed. The list of the categories shown are paper/cardboard, plastic packaging, glass, aluminum, ferrous.

After the pandemic breakout, the quantity of paper/cardboard, plastic packaging and glass collected was increased. The quantity of aluminum and ferrous collected was slightly decreased.




Recyclable materials of Eastern Thessaloniki 2020
0,70%
4,20%
5,95%
19,46%
69,68%
ΧΑΡΤΟΝΙ/ΧΑΡΤΙ [6.412.089,19 Kg]
ΠΛΑΣΤΙΚΕΣ ΣΥΣΚΕΥΑΣΙΕΣ [1.791.016,64 Kg]
ΓΥΑΛΙΝΕΣ ΣΥΣΚΕΥΑΣΙΕΣ [386.909,52 Kg]
ΣΥΣΚΕΥΑΣΙΕΣ ΑΛΟΥΜΙΝΙΟΥ [63.964,88 Kg]
ΣΥΣΚΕΥΑΣΙΕΣ ΣΙΔΗΡΟΥ [547.601,78 Kg]


Recyclable materials of Eastern Thessaloniki 2021
4,81%
0,59%
5,66%
18,39%
71%
ΧΑΡΤΟΝΙ/ΧΑΡΤΙ [7.365.428,70 Kg]
ΠΛΑΣΤΙΚΕΣ ΣΥΣΚΕΥΑΣΙΕΣ + ΤΕΤΡΑΠΑΚ [1.919.855,96 Kg]
ΓΥΑΛΙΝΕΣ ΣΥΣΚΕΥΑΣΙΕΣ [591.109,32 Kg]
ΣΥΣΚΕΥΑΣΙΕΣ ΑΛΟΥΜΙΝΙΟΥ [61.303,81 Kg]
ΣΥΣΚΕΥΑΣΙΕΣ ΣΙΔΗΡΟΥ [502.392,21 Kg]

ITALY

The COVID pandemic has produced significant impacts in both positive and negative environmental terms.

There are some sector and areas in which are registered relevant environmental changes everywhere, including:

- ➔ mobility - transportation
- ➔ waste production and management
- ➔ chemical products use
- ➔ consumption and resource use (plastic packaging)
- ➔ energy consumption

In a Report the European Environmental Agency highlighted the following elements:

- ➔ The COVID-19 pandemic further highlights the interrelations between our natural and societal systems: societal resilience depends on a resilient environmental support system.
- ➔ Biodiversity loss and intensive food systems make zoonotic diseases more likely.
- ➔ Often related to social inequalities, environmental factors such as air quality appear to influence COVID-19 outcomes.
- ➔ Increased reliance on single-use plastics and low oil prices resulting from lockdowns have negative consequences.
- ➔ Lockdowns during the COVID-19 pandemic may have some direct, short-term, positive impacts on our environment, especially in terms of emissions and air quality, although these are likely to be temporary.

Speaking about the positive impacts due to the pandemic period, certainly the main concerns the reduction of air pollution and greenhouse gas emissions. At the same time this emergency shows clear negative signs on other aspects, for example the increased consumption of packaging and single-use plastic products, as a result of the hygiene requirements.

Specifically, some of those impacts have been analyzed in some studies[8] conducted at regional level during the lockdown period (February-March 2020), therefore connected to the health measures taken to combat the pandemic from COVID-19.

Speaking about the positive impacts concerning the reduction of air pollution and greenhouse gas emissions, the parameters have been analyzed, such as pollutant concentrations, meteorological trends, pressure trends on the atmospheric environment and mass flows emitted to compare them with those found in previous years, from 2016 to 2019.

The main results obtained showed that:

1. The gaseous pollutants (benzene, monoxide and nitrogen dioxide) showed significant declines both compared to the months of March 2016-2019 and compared to the periods preceding the lockdown. The reduction values, taking into account the uncertainties of estimation, evaluation and measure, move in a range between 30 and 50%.
2. The particulate matter PM10 and PM2.5, showed a complex dynamic. The PM10 did not show marked variations on average, compared to the average of the months of March of previous years, but they have highlighted a marked reduction in the highest values, demonstrating a frequency distribution shifted to lower concentrations. The decreases in both particulate matter - PM10 and PM2.5 - were equally evident.

The main cause of these reductions is the drastic drop in road transport.

In this regard, ART-ER has also conducted a survey, at regional level, about the mobility managers[9] and their level of dissemination among enterprises as a result of the impact that the Covid-19 pandemic has had on the production system, changing workplaces and way of working, influencing home-work journeys. The survey shows some positive environmental impact, at regional level, considering the reduction of 12% of workers who move in daily life with a consequent reduction of 113.447 tons of CO2 per year and 61,7 million of euros per year in fuel (corresponding an annual absorption of more than 7 thousand hectares of forest).

The survey shows that before the pandemic, only 0,4% of workers had activated a SW contract for two days a week, while during the pandemic have reached the 21% of workers for 4 days a week from home.

Finally, if on the one hand the pandemic has developed, when possible, the theme of smart working, with consequent environmental benefits, on the other hand the workers, who worked in presence, had moved by private car.

[8] Life project PREPAIR, Studio preliminare degli effetti delle misure covid-19 sulle emissioni in atmosfera e sulla qualità dell'aria nel bacino padano, June 2020.

[9] ART-ER , La mobilità durante la pandemia, April 2021

Another very important area to analyze as a result of the economic dynamics and changing lifestyles of people that characterized the covid emergency is waste production and management.

To date, reports on waste management in Emilia Romagna Region during[10] the period of the covid emergency (specifically the year 2020) are not yet available but it is possible to make some qualitative assessment.

As regards the production of municipal waste, it is possible to record negative effects on the percentage of separate collection and recycling of waste and a consequent increase in the production of mixed waste.

With regard to the production of waste produced by enterprises, it is possible to consider that the lockdown has led to a reduction in overall waste production, but with negative effects on the percentage of waste for recovery.

The regional administration promotes its policies on the circular economy to encourage the recovery of waste and its transformation into secondary raw materials for new production cycles. In fact, analyzing the available waste production and management trends are related to 2018 and 2019, as far as municipal waste is concerned (with reference to 2019 data), in the face of an overall slightly lower production in 2019 (0,9% per capita) than in 2018, separate waste collection reached 71%, confirming the positive trend of recent years: a very significant result when compared to the national average of 61,35%.

The available data on waste produced by economic activities relate to 2018 and highlight: in this year, in Emilia-Romagna a total of 14.019.213 tonnes of special waste were produced, of which 5.346.406 tonnes (estimated by management) are construction and demolition waste and most of the waste produced is destined for material recovery, equal to 72% of all waste managed.

Another important element to be considered due to covid emergency in terms of waste production is related to increased online purchasing of products with consequent increased production of packaging waste.

The analysis in this chapter is completed by illustrating the results of a survey[11] carried out by ART-ER from November to December 2021 to examine some aspects related to the circular economy and the dynamics of the covid emergency in terms of environmental sustainability.

About 1.000 small, medium and large-sized enterprises in a number of sectors representative of the regional production system were interviewed (agri-food, textile - clothing, chemical, energy, automotive, packaging manufacturing sectors).

Most of the enterprises interviewed first of all stated that they had experienced a reduction in turnover during the covid emergency.

These are enterprises that in most cases have already adopted circular economy models as shown in the following graph.

[10] ART-ER, La Gestione dei rifiuti in Emilia-Romagna, 2020

[11] https://www.osservatoriogreener.it/

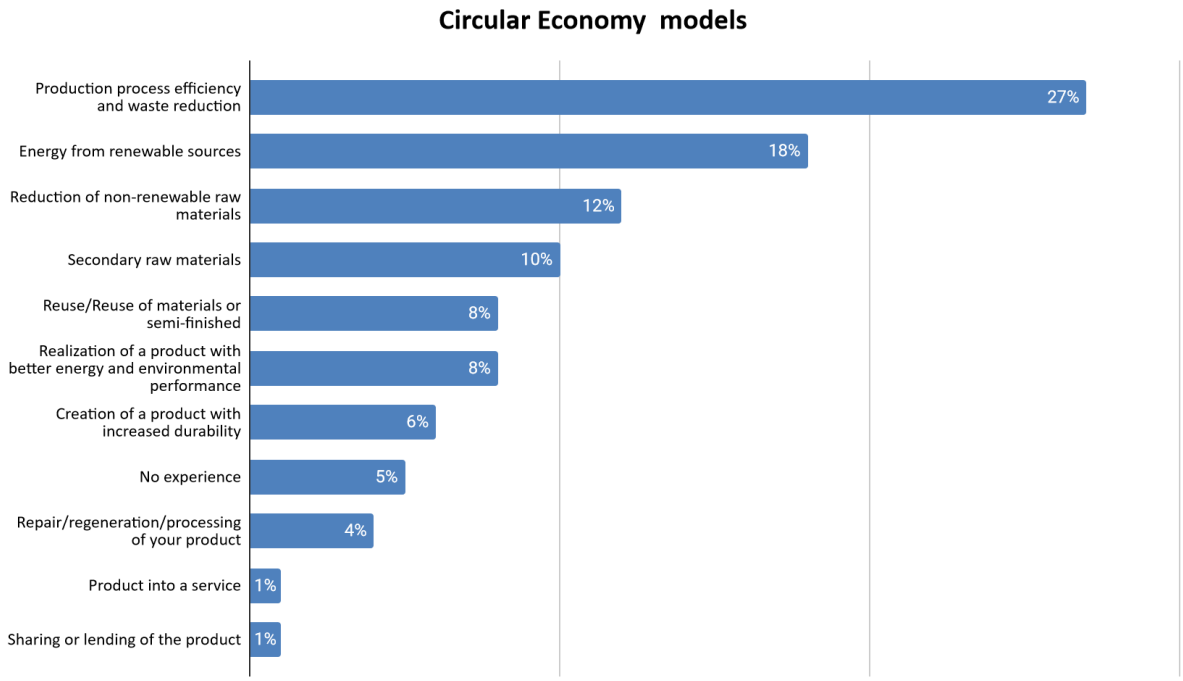


Figure 15 Osservatorio Greener - Circular economy models

There are a few enterprises interviewed that haven't yet adopted a circular economy model.

When it talks about a circular economy, enterprises pay particular attention to issues regarding not only reducing waste but also making processes more efficient, using energy from renewable sources and reducing the use of raw materials.

The enterprises say in most cases that they have had, in the last 3 years (including the covid emergency) a reduction in the production of waste due to the production process. The data on the use of recycled material entering the production process is still very low for more than half of the companies surveyed. The reasons for this limit are many, but in particular the lack of a reference market at national level and the quality of recycled material compared to non-recycled raw materials have an impact.

Considering the environmental effects caused by the covid emergency, it appears that most of the enterprises surveyed have experienced changes that have generated positive or negative effects in terms of environmental sustainability.

The main areas where positive effects have been recorded are:

- reduction in chemical consumption
- reduction in water consumption
- reduction in the use of plastic packaging
- reduction in home-work journeys

The main areas of negative impact are:

- increased consumption of non-renewable raw materials
- increased consumption of energy
- increased use of packaging other than plastic
- increased road transport

The analysis of the environmental impacts generated by the covid pandemic on the production system has highlighted what can be the strengths in terms of environmental sustainability for a company.

-circular economy (closing cycles and supply) gives greater autonomy to enterprises;

-local production of renewable energy prevents risks of energy interruption;

-short supply chain supplies and industrial symbiosis processes can ensure continuity of production;

-greater integration between production and consumption;

-local network can assure better resilience for the enterprises;

-transition to the digital system and dematerialization can reduce the overproduction of packaging and significant use of protective and transport materials for product delivery.

4. Pandemic and SMEs:

Which categories of SMEs have flourished during the pandemic?

Which categories of SMEs were negatively affected and shrunk?

Undoubtedly, COVID-19 changed the way companies work. The crisis has seriously affected the performance of the Bulgarian SMEs, all of which marked drastic declines compared to 2019, incl. production volumes decreased in 66% of companies, sales/ turnover - by 73% of them, foreign markets - by 43%, jobs - by 56%. Wages are the least affected, falling in 26% of companies.

The survey conducted by BAMEE in cooperation with Cluster Sofia Knowledge City and University of Mining and Geology among 50 companies and public organization in the framework of the CESME project **outlined the interest in green transformation and the circular economy** (in total 39 respondent) among which:

ANSWER CHOICES	RESPONSES	
Supplier company - develops and delivers services, technologies and products for customers seeking the effect of green transformation and the circular economy;	28.21%	11
Client company - buys and implements services, technologies and products for its own sustainable and "green" development;	5.13%	2
Non-governmental organization - works in private or public benefit for the implementation of projects in this field;	23.08%	9
Public, state, or municipal organization - is engaged in conducting policies and implementing projects at national or local level;	7.69%	3
Consulting or business support organization - provides professional consulting and mediation services and technical assistance in this field;	10.26%	4
Investor organization - provides equity or attracted capital to invest in "green projects";	2.56%	1
Scientific or educational organization - representatives of the academic community, researchers and teachers;	23.08%	9
I have no interest	0.00%	0
TOTAL		39

For 86% of the respondents, "green" business models are a key tool for competitiveness and provide possibility for overcoming the negative impact on their activities due to COVID-19 crisis. In the context of the pandemic, businesses have sought new ways to survive, including by launching or developing online sales (23%), as well as transforming production into new products and / or markets (19%). 36% of the enterprises have made investments in order to comply with the anti-epidemic regulations. Only 2% have increased their teams with new appointments.

In addition, a survey of the **Bulgarian Chamber of Industry conducted in May-June 2021 among 550 SMEs** shows that small number of companies have benefited from anti-crisis measures to support business. The "60/40" measure is the most popular - 28% have benefited from it. The next preferred measure is the grant for micro and small enterprises in the amount of € 1500 to 5000, used by 27% of respondents, and in third place is the moratorium on loan payments - 17%.

Only 12% of the companies in the "transport" and "tourism" sectors have benefited from the measure to preserve employment being € 250 / month. Only 1% of the respondents have benefited from the measures offered by the Bulgarian Development Bank, and 2-5% are considering or exploring the

possibilities. For all others, these measures are either inapplicable or unknown. 40% of those using anti-crisis measures complain about the slow process, and 35% - from bureaucracy and heavy documentation. 11% did not face obstacles in receiving aid.

The lack of liquidity in the crisis is the main reason why respondents expect support in retaining staff by taking part of their remuneration (56%), as well as reducing or postponing state (52%) and municipal (38%) payments, incl. taxes, fees and rents. Businesses also expect support from the state for low-interest loans (35%), for deferral of payments on existing loans (27%), as well as for modernization and technological renewal (26%). Only 9% of respondents declare that they do not need state support.

The increased number of infected and / or quarantined workers leads to a significant burden on other employees - 47% of surveyed employers believe, and 12% of them complain that the lack of workers leads to delays in the execution of assigned contracts / contracts, which is reason for reduced turnover / revenue (7%). 30% of the respondents indicate that there are no more absent workers than every other year, and 4% declare that they have no quarantined staff at all.

A study conducted in the beginning of 2021 by the German-Bulgarian Chamber of Industry and Commerce among the representatives of 60 companies from 36 sectors summarizes how SMEs and entrepreneurs are responding to the COVID-19 challenges. Many employers have introduced various measures to meet the challenges and create normal working conditions. Some of them give good results and can be maintained as good practices even after the pandemic. When asked which of the measures introduced during the pandemic, employers plan to maintain after it, 43 companies will maintain digital workshops as a practice in the future. Another 38 plan to maintain the remote operations and increase the processes associated with reducing paper use. 46% of the respondents (28 companies) will invest in cloud services and processes, 12 percent (20 companies) - on increasing investment in digitalization. 6 percent (10 companies) have stated that they will give up the office as a place to work.

The pandemic has led to changes in customer needs and requirements in 16 of the companies. 1/4 of the surveyed companies are of the opinion that there is a need for more investments in cybersecurity. In just over 20% of survey participants, customer interest in online purchase and customer relation, and services has increased. For 70% of the surveyed companies, digitalization is becoming a more important priority due to the COVID-19 pandemic.

The survey also examines barriers for companies to use more digital technology and to introduce new business models to be more competitive after the pandemic ends. Among the main obstacles are the qualifications of employees (for about half of the surveyed companies - 29), followed by the number of investments needed in 23 of the companies. For the other 10 companies, the use of innovative and digital technologies and processes is not essential, as they currently have other priorities. In 9 of the companies, the pandemic has caused lasting negative effects that hinder their business performance.

Based on the answers of the respondents, the greatest potential for overcoming some of the negative effects of the pandemic is in the field of optimizing resources such as time, potential and investment (for 42 companies) and developing new business models and services (38 companies). About 1/3 of the participants in the survey identified areas as improved interaction with customers (31 companies), fully integrated digital processes (30 companies) and production automation (28 companies) as those with great potential. Areas such as improved communication with employees (25 companies), improved

interaction with suppliers (23 companies), mapping and transparency of business processes (22 companies), related interfaces (21 companies) and improved visualization (17 companies) follow. According to the respondents, the least potential is in information about the product life cycle, which is important for only 9 of the companies.

FINLAND

Which categories of SMEs have flourished during the pandemic?

Industrial production, food and other manufacturing companies have survived the effects of the pandemic best. During the pandemic, people built and renovated their homes and made significant investments in various hobbies. This has helped many small enterprises to cope with the effects of the pandemic.

Which categories of SMEs were negatively affected and shrunk?

Small companies specializing in service, tourism and passenger transport have suffered the most from the pandemic. Long outages in service companies, such as restaurants, have had a negative impact on operations.

Results and responses to SME questionnaire

The CESME partners from Finland received 34 answers to the SME questionnaire. The following conclusions can be drawn from the answers:

- 22 out of 34 SMEs do apply activities related to sustainable development or circular economy.
- 23 SMEs said covid-pandemic impacted their business (for most of the respondents the impact was negative, but for some also positive)
- 26 out of 34 said that the **pandemic did not have impact on sustainable development or circular economy activities within the SMEs**
    - The 8 who claimed impact stated that some of the investment and development plans had to be postponed.
- 13 out of 34 utilised covid-funds and support.
    - Only one of them utilised the fund for green activities.
- 12 out of 34 SMEs have however plans to develop sustainability and circular economy in their companies.

Sustainable activities among SMEs

Four types of activities can be found in the SMEs' answers. Firstly, ten out of the 22 respondents mentioned recycling and sorting of waste materials, re-use of materials and repairing of broken products as sustainability activities pursued in their company.

Secondly, seven of the respondents mentioned that they pay attention to the procurement of sustainable materials and equipment. Most of the SMEs mentioned that they pursue to buy recycled products, such

as office equipment and vehicles. Few of the SMEs stated that they pursue to buy materials as near as possible.

Thirdly, four (4) SMEs mentioned that they pursue sustainability in the energy use. Two SMEs mentioned to use renewable energy as their primary source of energy. Three SMEs also mentioned to have made investments related to energy use and production, such as investments to reduce energy consumption as well as utilization of waste heat as energy.

At last, few of the SMEs said to have paid attention to their ways of working. The SMEs stated that they work in terms of the nature and in all their activities pursue to restrain nature as little as possible. Activities included waste-water management, avoiding unnecessary use of cars, improving the use of online services, organizing trainings online etc.

When asked about future investments to sustainable development twelve of the 34 SMEs responded that they are planning on such investments. The plans for future included were: further development of online trainings, participation in Sustainable Development programs directed for SMEs, improving sustainability of packaging, investing to renewable energy, improving sustainability of production, improving energy efficiency of lighting and heating, improving paperless office through digitalization.

Covid-19 impacts on the SMEs

23 out of 34 SMEs answered that the pandemic had an economic impact on the SME. Most of the reported impacts were negative. Only one of the respondents stated that the impact was purely positive for the SMEs. Two SMEs stated that the impact was neutral.

Twelve (12) of the respondents stated that the pandemic impacted negatively in the demand of their products or services. Many of them although stated that the impact was temporary and has since recovered. For few of the SMEs the cancelling of events and fairs had a severe impact as they were the only market channel for their products.

Few SMEs also mentioned impacts in the operations. Within the construction companies new working methods on the construction sites had to be found to avoid physical contacts. The staff has also found hard to stay motivated.

Three SMEs experienced material shortages and rising prices in materials, which impacted negatively in the production and profit margins.

When asked about the impact of the pandemic in sustainable development activities, only eight (8) SMEs out of 34 responded that the pandemic had an impact in the sustainable development activities. For most this meant that investments for sustainability measures had to be postponed. One Food SME also experienced that during the lockdowns and due to cancellation of food fairs (the main selling channel) a large amount of their products ended up as food waste as products were not sold.

The positive impacts reported related to the digitalisation and use of e-services. One SME, whose main business idea is to repair and sell used cars, noticed that the demand for their services and products rose substantially during the pandemic.

Utilisation of covid-19 funds

Thirteen (13) of the SMEs utilized covid-19 funds in some ways. Most of the SMEs utilized the business cost support. Few utilized also the support for sole proprietors as well as the closure compensation. Five

SMEs also utilized the RDI support for development projects. All used the funds for developing new products.

One SMEs utilized the funds to develop a new product that relates to sustainable development and circular economy. The SME developed a new cleaning tool, that is made 100 % of the residual material from the production.

A local study about business models after the covid-19 pandemic
Seinäjoki University of applied sciences carried out a study in the region with the aim of updating state of art of local SMEs' economic lookout as well as growth and development perspective and also clarify the changes and development needs for business models caused by the pandemic. The study was carried out in late 2021 and 213 SMEs responded to the questionnaire. The study was carried out as part of a development project funded from the Supporting Sustainable Growth and Vitality in Regions program.

The study shows that the economic impacts of the pandemic to local SMEs were rather mild.

Changes in the number of employees (in last 1-2 years)

- 44 % reported no change
- 42 % reported growth
- 14 % reported decrease

Economic vitality during the pandemic (past 1-2 years)
The SMEs was asked to compare their economic situation to their competitors around five areas: return on investments, operating profit, liquidity, indebtedness and cost-management from scale one to seven (one being week and 7 being excellent). The average score for the economic vitality of the SMEs was 4,7, which is rather positive result.

Business success
The SMEs were asked to compare their business success to their competitors around six areas from scale one to seven. The average result was 4,6, which is rather positive.

- Development of new products or services, average: 4,6
- Amount of sales, average: 4,6
- Market share, average: 4,5
- Expanding of markets, average: 4,4
- Development of human resources, average: 4,6
- Improvement of stakeholder relations, average: 4,7

Success of main place of business
On scale one to 7 the SMEs estimated that their main place of business has succeeded during the past years rather well, with the average score of 4,6.

Development of revenue during the pandemic

- 5 % of the SMEs reported strong growth in revenue during the pandemic.
- 37 % reported moderate growth in the revenue
- 30 % reported no change in the revenue
- 10 % reported slight decrease in the revenue
- 15 % reported substantial decrease in the revenue
- 3 % of respondents were less than 3 years old.

Growth objectives
11 %of the respondents are aiming for strong growth, 46 % aim for moderate growth and 37 % aim is to keep up their existing level.

Changes in the business strategies
72 % stated that they did not change their business strategy due to pandemic and 28 % stated that they needed to change that business strategy.

Growth strategies after pandemic
When asked about importance of different growth strategies in the future the following results were received. (Scale 1=not important and relevant in the company, 7= very important for the company)

- WE need to deepen our existing customer relations and find new customers at the existing markets, score: 5,4
- WE need to develop new products and services for the existing markets, score: 4,8
- WE look new markets for our new products/services, score: 4,6
- We develop completely new products for new markets, score: 3,4
- We develop completely new business models, score: 3,2

Development priorities in future (from scale 1 to 7)
When asked about development priorities in future the following results were received. (On scale 1-7, one = not important, 7 = very important).

- Development of new products and services, score: 4,6
- Expanding the selection of already existing products/services, score: 4,7
- Finding new market areas, score: 4,7
- Learning new technologies, score: 4,7
- Improving quality of existing products or services, score: 5,2
- Improving flexibility, score. 4,7
- Costs reduction, score: 4,9
- Improving efficiency, score: 5,4

Digital orientation of SMEs
According to the responds, the SMEs seem to be rather well digitally oriented and use digital technologies in their solutions and products / services. The average score from scale one to seven was 4,7.

- Adaption to new digital technologies is easy, score: 5,2
- We constantly look for new possibilities to utilise digital technologies in our innovations, score: 4,6
- We use digital technologies to develop new solutions, score: 4,6
- We use latest digital technologies in our solutions, score: 4,2

Need for external expertise
When asked about the needs for various types of external expertise, traditional kinds of support areas stood out from the responds. Most important areas being digital marketing expertise, marketing expertise, technology expertise and RDI expertise. Expertise around sustainability and responsibility issues got moderate scores.

- Need for digital marketing expertise, score: 4,3
- Need for marketing expertise, score: 4,2

- Need for technology expertise, score: 4,1
- Expertise in product and service development, score: 3,9
- Expertise in Digital processes, score: 3,6
- Expertise in law, score: 3,6
- **Expertise in resource efficiency, score: 3,5**
- **Expertise in responsibility, score :3,4**
- Expertise in digital trade, score: 3,4
- **Expertise in life-cycle-assessments, score: 3,3**
- Expertise in HR, score: 3,3
- **Expertise in reduction of environmental impacts, 3,3**
- Expertise in strategy, score: 3,2
- Expertise in management, score: 3,1

Expertise in international business, score: 2,8

GREECE

The situation in Region of Central Macedonia

The COVID-19 pandemic has had a significant impact on small and medium-sized enterprises (SMEs) in Greece and different policy measures have been taken to help them recover. SME value added declined in almost all sectors. The most affected sector was accommodation and food services, where SME value added fell by 58.1%. The construction sector was the only one that grew in terms of SME value added, with a growth rate of 18.1% (European Commision, 2021).

Sectors particularly affected by the crisis include transport, wholesale and retail trade, air transport, accommodation and food services, real estate, professional services and other personal services (eg hairdressers). In countries such as Greece and Italy, the above sectors account for almost 90% of the employment.

According to the survey on behalf of the Chamber of Commerce and Industry of Thessaloniki (CCIT), 39% of the companies that participated, said that they have been greatly affected by the crisis of the epidemic and 60% of the companies answered that their turnover has decreased due to the pandemic at a rate of 21-40%. 70% of the companies that participated, answered that they have been strengthened in 2021 by some measures of support received by the Government, due to the COVID-19 pandemic (repayable advances, rent subsidy, suspension of employment contracts, etc.) (CCIT, 2022).

Received questionnaires

In the context of the research of the present study, 2 questionnaires were used in order to capture the current situation in the Region of Central Macedonia. One questionnaire was addressed to SMEs in the RCM and the other to the RCM.

The following are the results of the descriptive statistical analysis of the data, based on the answers given, and the corresponding diagrams, which help in understanding. The answers that are commented refer exclusively to the companies / bodies that took part in the questionnaire.

<u>Questionnaire to SMEs</u>

The questionnaire concerning companies was sent to 55 of them, while 12 of them answered.

The main activities of the companies which answered are: energy production of biogas, retail of fruit and vegetables by e-commerce, property rental services, fishnet production, trade of means of personal protection (masks, gloves, etc), grocery, fish canning, production of fertilizers, processing of agricultural products, management of recyclable items.

91.7% of companies answered that they are following some measures / actions of sustainable development and circular economy at the moment. Some of these actions mentioned by the companies are:

- Production of electricity from biogas
- Minimize food losses. Promotion of mainly seasonal local fruits and vegetables. Reduced use of packaging.

- Social Plate action, through which the suitable for eating but non-marketable fruits and vegetables of the traders, are available in social bodies, after sorting.
- Management measures for electric devices (circular economy - preparation for reuse)
- Composting
- Reduce the plastic used by removing disposable plastics, selling bulk products for less packaging. Energy saving (replaced all bulbs with led).
- A large part of the equipment of the store comes from reusable materials (shelves, refrigerators, etc). Reuse pallets, distribute short-lived food to social organizations and offer reusable bags.
- Recycle various materials (paper, glass, plastic, metal, toner, etc.), including plastic lids.
- Distribute seeds of traditional varieties through the seed bank of Peliti.
- Energy production from sludge, recycling of styrofoam, paper, plastic, iron, aluminum, stainless steel, animal by-products for animal feed production.
- Send for recycling old nets, yarn and net retaliation, cardboard, nylon etc
- Anaerobic waste digestion
- Reuse of packaging. Utilization of agricultural residues. Utilization of by-products from the processing process. Use of sustainable and reusable packaging materials.

75% of the companies answered that the pandemic has had an impact on their activities in general.

75% of the companies answered that the pandemic has not had an impact on the implementation of their activities related to sustainable development and circular economy.

The impact was negative in all cases:

- The most important problem was to contact the customers and the difficulty to deal with covid, regarding the employees.
- There were Increased sales of specific codes related to the pandemic and great collapse of the sales of all other codes.
- Increase in production costs (Raw materials and energy)
- Difficulties with the distribution of products
- Cessation of activities
- Due to the conditions, it was difficult for the social organizations to come to pick up the products

66,7% of the companies answered that the pandemic did not bring new activities of sustainability and circular economy to them.

In the rest of the companies, some of these activities are:

- Production of new products using old ones
- Equipment and installation of space air purification
- Energy and resource savings
- Creation of new companies

75% of the companies did not use sources of funding aimed at businesses during the coronavirus crisis.

The rest of the companies that did use sources of funding, they used them in sustainable development actions.

83,3% of the companies have investment or development plans related to sustainable development or the circular economy.

The companies suggested the following actions / measures or good practices that have managed to mitigate the effects of the pandemic on them:

- Financing, returnable advances, etc
- Promotion of healthy products that strengthen the immune system
- Observance of strict health protection measures in the stores, so that customers are not afraid
- Delivery and e-shop so that people can be served without congestion
- Purchases of raw materials in advance (coverage of 1/3 of the annual need)
- Personal hygiene and responsibility (more hand sanitization points, weekly disinfection facility implementation, continuous monitoring of staff health and safety of workers to prevent the spread of the pandemic
- VAT reduction
- Gradual digital reform

Questionnaire to the Regional Authority

The second questionnaire was addressed to the Region of Central Macedonia (RCD). The RCD answered that there is a recording of the financial impact of COVID-19 in the region for the period 2020-2021, through the Economic Chamber of Greece which has investigated the effects of the pandemic in the region in the fields of Tourism, Industry and Retail.

There is no recording or documentation of the environmental impact of COVID-19 in the region for the period 2020-2021.

The region has already implemented some actions to financially support or strengthen small and medium enterprises. Particularly it has financed 6820 companies, with the increase of liquidity, with 204 million euros through the EXIT program.

SME support includes supporting sustainability and circular economy. It includes companies that deal with sustainability and circular economy. The financing was based on the type of activity and not in actions.

The region is unaware of other actions or good practices that could mitigate the effects of the pandemic on SMEs in relation to sustainable development.

Circular economy and the COVID-19 recovery

Given the current COVID-19 pandemic, there has never been a more adequate time to consider how the principles of CE could be translated into reality when the global economy begins to recover. This is pertinent because the pandemic has further exposed the limitations of the current dominant linear economy regarding how it is failing the planet and its inhabitants and has revealed the global ecosystem's

exposure to many risks including climate breakdown, supply chain vulnerabilities and fragility, social inequality and inherent brittleness. The pandemic continues to amplify the global interlinkages of humankind and the interdependencies that link our natural environment, economic, and social systems. In the subsections that follow, the potentials of CE as a tool for: (i) climate change mitigation; (ii) crafting a more resilient economy, and ; (iii) facilitating a socially just and inclusive society, is briefly discussed (Ibn-Mohammed et al., 2021).

(i) Circular economy as a tool for climate breakdown mitigation

There is the need for a system that calls for greater adoption of a more resilient low-carbon CE model, given the predictions by experts that climate breakdown and not COVID-19 will constitute the biggest threat to global health. International bodies and country-level environmental policies have highlighted the fact that a significant reduction in GHG emissions cannot be achieved by transitioning to renewables alone but with augmentation with CE strategies. The demands side CE strategies such as *(i) material recirculation* (more high-value recycling, less primary material production, lower emissions per ton of material); *(ii) product material efficiency* (improved production process, reuse of components and designing products with fewer materials); *(iii) circular business models* (higher utilisation and longer lifetime of products through design for durability and disassembly, utilisation of long-lasting materials, improved maintenance and remanufacturing), could reduce emissions whilst contributing to climate change mitigation. CE principles, when adopted in a holistic manner, provide credible solutions to the majority of the structural weaknesses exposed by COVID-19, offering considerable opportunities in competitiveness and long-term reduced GHG emissions across value chains. Investments in climate-resilient infrastructure and the move towards a circular and low-carbon economy future can play the dual role of job creation while enhancing environmental and economic benefits.

(ii) Circular economy as a vehicle for crafting more resilient economies

Resilience in the context of the CE largely pertains to having optimized cycles (i.e. products are designed for longevity and optimized for a cycle of disassembly and reuse that renders them easier to handle and transform). Some cycles can be better by being closed locally (e.g. many food items), and for other cycles, a global value chain could be a better option (e.g. rare earth elements). Due to globalization, all cycles have become organized at the global level, diminishing resilience. COVID-19 has further shown how some particular cycles had the wrong scale level, as such, the adoption of CE can be seen as an invitation to reconsider the optimal capacity of cycles.

(iii) Circular economy as a facilitator of a socially just and inclusive society

CE has the potential to minimize prevailing pressures and struggles regarding conflicts due to imbalanced distribution of resources, through participatory forms of governance that entails the inclusion of local stakeholders in resource management initiatives. This can be achieved through the adoption of CE

strategy such as closed-loop value chains, where wastes are transformed into resources with the view to not only reduce pollution but to simultaneously aid the pursuance of social inclusion objectives.

Circular economy practices implemented by the state, businesses and consumers can make a significant contribution to curbing adverse environmental change, while strengthening the corporate responsibility identity and corporate ESG (environment, society and corporate governance) criteria. On the business side, environmental ESG criteria align with various circular economy objectives, while companies

incorporating them into their business strategy often prove to be more attractive to investors, with better financial performance.

In terms of regulators, the EU is leading the transition to a circular economy through the New Circular Economy Action Plan and other regulations, such as those on waste management. Greece recently introduced the New Action Plan for the Circular Economy 2021-2025, adopting other relevant regulations, such as the Life - Circular Economy Program, but also policies to reduce waste through the National Waste Management Plan. According to the Action Plan for the Circular Economy, the financing of the transition to the circular economy in Greece will come from co-financed European programs such as the NSRF 2021-2027 and the National Recovery Plan Greece 2.0, through the axis for the green transition and achievement of climate targets (Alpha Bank, 2021).

ITALY

Covid-19 has brought about an unprecedented crisis for the Italian economy, not only in terms of dimensions, but also because of its particularly asymmetrical nature. The emergency has in fact had highly diversified consequences, damaging in particular the sectors most affected by lockdowns and exposed to containment measures (such as restaurant business, tourism, the hotels, transport, wholesale non-food retail, the fashion system), affecting less significantly or even positively stimulating other sectors (pharmaceutical supply chain, e-commerce, agri-food industry). Concerning business demography, the pandemic has greatly reduced the births of new capital companies throughout the Peninsula. The effects were particularly marked in the first half of 2020, due to the first national lockdown, with a reduction of the new societies of approximately a quarter regarding the same period of 2019; in the following six months the decrease was smaller, but the reduction didn't stop (-3%).[12]

The table below shows, at Italian national level, which are the categories of SME that have the best and the worst growth in the interval 2019/2020.

The sectors that flourished during the pandemic are: e-commerce (+19%), pasta (+9,5%), rice (+7,3%), Pharmaceutical specialties (7,2%), Modern food distribution (+5,5%), Chemistry and pharmaceuticals (4,8%), Cleaning products (+3%), Oils and greases (2,5%), Cured meat (2,2%), Wholesale of pharmaceuticals and medical products (+2,1%).

The sectors that were negatively affected are: organization of fairs and conferences (-67,2%), Travel agencies and tour operators (-54,6%), Air transport (-50,4%), Hotels (-50,4%), Airports management (-49,6%), Accommodation (Non-hotels) (-46,2%), Restaurant business (-40,3%), Cinema industry (-33,6%), Parking management (-32,6%), Information, communication and entertainment (-31,9%).

[12] Confindustria, Cerved , Rapporto regionale PMI 2021

Tabella A - I settori con la maggiore e la minore crescita dei ricavi nel 2020

Settori con le peggiori performance	Var. % 2020/2019	Numero PMI	Settori con le migliori performance	Var. % 2020/2019	Numero PMI
Organizzazione di fiere e convegni	-67,2%	296	Commercio on line	19,0%	240
Agenzie viaggi e tour operator	-54,6%	578	Pasta	9,5%	196
Trasporti aerei	-50,4%	40	Riso	7,3%	41
Alberghi	-50,4%	3.520	Specialità farmaceutiche	7,2%	194
Gestione aeroporti	-49,6%	68	Distribuzione alimentare moderna	5,5%	2.562
Strutture ricettive extra-alberghiere	-46,2%	625	Chimica e farmaceutica	4,8%	83
Ristorazione	-40,3%	8.020	Prodotti per la detergenza	3,0%	123
Industria cinematografica	-33,6%	415	Oli e grassi	2,5%	143
Gestione parcheggi	-32,6%	149	Salumi	2,2%	467
Informazione, comunicazione e intrattenimento	-31,9%	1.425	Ingrosso prodotti farmaceutici e medicali	2,1%	1.013

Figure 16 SME sectors with the best and the worst growth in the year 2020 source: Confindustria, Cerved "Rapporto regionale PMI 2021" p. 10

The table below shows the sectors of specialization of SME per Region.

In Emilia-Romagna Region, among its 15.503 SME, the main sectors are: services (48,4%), industry sector (34,8%), non-financial services (19,9%), distribution (17,8%), buildings (12%), mechanical engineering (11,5%).

Tabella 1.5 - Specializzazione settoriale delle PMI per regione

	Italia	Nord-Est	Emilia-Romagna	Friuli-Venezia Giulia	Trentino-Alto Adige	Veneto	Nord-Ovest	Liguria	Lombardia	Piemonte	Valle d'Aosta	Centro	Lazio	Marche	Toscana	Umbria
aziende agricole	**1,6%**	**1,8%**	**2,4%**	**1,6%**	**1,8%**	**1,4%**	**1,0%**	**0,9%**	**0,9%**	**1,2%**	**1,3%**	**1,2%**	**0,8%**	**1,1%**	**1,4%**	**3,3%**
industria	**27,7%**	**34,4%**	**34,8%**	**34,7%**	**14,8%**	**37,9%**	**31,0%**	**17,2%**	**31,7%**	**32,9%**	**11,9%**	**24,1%**	**8,8%**	**44,4%**	**35,2%**	**26,3%**
largo consumo	**3,4%**	**3,8%**	4,6%	3,6%	3,6%	3,1%	**2,5%**	2,5%	2,2%	3,6%	5,6%	**2,9%**	2,0%	3,2%	3,6%	4,2%
sistema moda	**4,4%**	**4,1%**	2,4%	0,9%	0,7%	6,8%	**3,4%**	0,5%	3,6%	3,6%	0,0%	**7,7%**	0,6%	12,7%	15,1%	5,7%
sistema casa	**2,1%**	**3,2%**	1,6%	7,5%	1,3%	4,1%	**2,0%**	0,6%	2,3%	1,2%	0,0%	**2,1%**	0,5%	6,7%	2,4%	1,6%
altri beni di consumo	**0,4%**	**0,5%**	0,4%	0,2%	0,3%	0,6%	**0,4%**	0,3%	0,4%	0,5%	1,3%	**0,3%**	0,1%	0,7%	0,3%	0,3%
mezzi di trasporto	**0,7%**	**0,5%**	0,4%	1,8%	0,1%	0,5%	**0,6%**	3,2%	0,4%	0,5%	0,0%	**0,9%**	0,3%	1,4%	1,4%	0,3%
chimica e farmaceutica	**0,8%**	**0,8%**	0,9%	0,7%	0,4%	0,9%	**1,2%**	0,7%	1,3%	0,9%	0,0%	**0,6%**	0,4%	0,8%	0,9%	0,6%
metalli	**5,2%**	**7,0%**	7,9%	7,5%	2,2%	7,1%	**7,1%**	2,4%	7,2%	8,0%	1,3%	**3,0%**	1,2%	6,3%	3,7%	4,4%
meccanica	**6,4%**	**9,5%**	11,5%	7,5%	4,0%	9,2%	**8,1%**	4,0%	8,2%	9,0%	2,6%	**3,5%**	1,6%	7,1%	4,2%	5,5%
hi tech	**1,5%**	**1,8%**	2,1%	1,9%	0,9%	1,7%	**1,9%**	1,7%	1,9%	2,0%	0,7%	**1,2%**	1,1%	1,4%	1,3%	1,1%
prodotti intermedi	**2,8%**	**3,2%**	3,0%	3,0%	1,3%	3,8%	**3,7%**	1,3%	4,0%	3,6%	0,3%	**1,9%**	0,9%	4,1%	2,3%	2,6%
utility ed energia	**2,8%**	**2,5%**	**2,4%**	**2,4%**	**5,6%**	**1,9%**	**2,5%**	**3,5%**	**2,4%**	**2,8%**	**7,0%**	**2,6%**	**2,8%**	**3,0%**	**2,1%**	**3,6%**
costruzioni	**13,7%**	**14,0%**	**12,0%**	**16,5%**	**20,4%**	**13,9%**	**12,7%**	**14,2%**	**12,3%**	**13,6%**	**18,5%**	**13,2%**	**14,7%**	**11,7%**	**11,4%**	**16,3%**
servizi	**54,1%**	**47,4%**	**48,4%**	**44,8%**	**57,4%**	**44,9%**	**52,8%**	**64,2%**	**52,7%**	**49,6%**	**61,3%**	**58,8%**	**72,9%**	**39,9%**	**49,9%**	**50,4%**
informazione e intrattenimento	**3,6%**	**2,9%**	3,2%	2,3%	2,5%	2,9%	**4,1%**	2,5%	4,4%	3,5%	3,6%	**4,2%**	6,0%	2,9%	2,5%	4,3%
distribuzione	**19,5%**	**17,5%**	17,8%	14,8%	21,1%	17,0%	**18,9%**	21,2%	19,1%	17,4%	17,2%	**19,1%**	20,9%	15,7%	18,3%	18,3%
logistica e trasporti	**6,4%**	**5,6%**	5,4%	6,1%	6,6%	5,5%	**5,6%**	12,9%	5,2%	5,1%	6,6%	**6,5%**	8,0%	5,1%	5,2%	5,6%
servizi non finanziari	**22,8%**	**19,5%**	19,9%	20,4%	24,8%	17,9%	**21,7%**	26,0%	21,2%	22,3%	31,5%	**26,9%**	35,3%	15,1%	22,0%	21,0%
immobiliari	**1,9%**	**1,8%**	2,1%	1,2%	2,3%	1,5%	**2,4%**	1,6%	2,8%	1,3%	2,3%	**2,1%**	2,7%	1,1%	1,9%	1,3%
Totale	**158.688**	**40.372**	**15.503**	**3.316**	**3.634**	**17.919**	**53.907**	**3.041**	**39.698**	**10.864**	**304**	**32.838**	**14.735**	**4.527**	**11.470**	**2.106**

Figure 17 Sectors of specialization in the italian regions source: Confindustria, Cerved "Rapporto regionale PMI 2021"p.32

Considering the impact of Covid pandemic on percentage of total number of SME and on turnover, in the Emilia-Romagna region the 9,1% of the SME are stable or increasing, the 76,1% had a moderate impact and the 14,8% had a strong impact; the turnover is stable or increasing for the 10,9%, had a moderate impact for the 74% and had a strong impact for the 15,1%.

Tabella 3.2
Distribuzione delle PMI per classe di impatto Covid
% sul totale del numero e del fatturato per regione

	Numero PMI			Fatturato		
	Stabili o in crescita	Impatto moderato	Impatto forte	Stabili o in crescita	Impatto moderato	Impatto forte
Italia	**9,0%**	**73,1%**	**17,9%**	**10,2%**	**72,1%**	**17,7%**
Nord-Est	**7,7%**	**76,1%**	**16,2%**	**8,6%**	**75,3%**	**16,1%**
Emilia-Romagna	9,1%	76,1%	14,8%	10,9%	74,0%	15,1%

Figure 18 Impact of the pandemic in Emilia-Romagna on number of Sme and on turnover Confindustria, Cerved "Rapporto regionale PMI 2021" p.54

Concerning the turnover in the period 2007-2020, in the region Emilia-Romagna there is a decreasing of 9,9% comparing 2019 and 2020 and a decreasing of 7,1% comparing 2007 and 2020.

Tabella 3.3 - Andamento del fatturato del PMI in termini reali, 2007-2020
Valori percentuali

	08/07	12/11	13/12	14/13	15/14	16/15	17/16	18/17	19/18	20/19	20/07
Italia	**-4,2%**	**-5,0%**	**0,2%**	**1,8%**	**4,5%**	**3,5%**	**2,1%**	**0,8%**	**2,2%**	**-10,6%**	**-10,7%**
Nord-Est	**-4,2%**	**-4,5%**	**0,5%**	**2,3%**	**4,6%**	**4,2%**	**2,6%**	**2,0%**	**1,9%**	**-10,7%**	**-7,5%**
Emilia-Romagna	-3,5%	-4,4%	0,6%	2,1%	4,5%	3,9%	2,9%	1,7%	1,5%	-9,9%	-7,1%

Figure 19 Turnover of SME in Emilia-Romagna, 2007-2020 source: Confindustria, Cerved "Rapporto regionale PMI 2021" p.56

5. Mitigation measures and funding to react on COVID19 so far at regional level

MAIN FINDINGS	KEY RECOMMENDATIONS
Fiscal and financial policy to mitigating the impact of COVID-19	
Bulgaria entered the pandemic in a strong fiscal position and has put in place a fiscal support package during the pandemic.	Extend duration of fiscal support measures to families and firms and expand them in case of a resurgence of the pandemic. Ensure an effective and rapid use of the available European Union funding to support the recovery. Once the recovery is well underway, move back towards a balanced budget by increasing revenues and improving spending efficiency, and longer term continue ensuring fiscal sustainability.
The 60:40 wage subsidy scheme has protected jobs and household incomes from the impact of the COVID-19 shock.	Establish additional benefit and employment programmes to protect those not covered by the social safety net and help people move to new jobs.
Non-performing loans have been reduced, but remain well above OECD average levels. Deteriorating economic prospects are expected to adversely affect asset quality in view of the potential worsening of the financial situation of firms and households as a result of COVID-19 pandemic.	Deepen liquidity support to firms and households through the financial sector, if warranted.
Improving the business environment and governance for a stronger post-COVID-19 recovery	
Competition in product markets is low, with regulatory barriers to competition that are higher than in nearly all OECD countries.	Put in place the implementing arrangements for the 2019 Law on Public Enterprises for the relevant public agencies, including municipal bodies. Increase the Competition Authority's detection and enforcement of sanctions on cartels and firms abusing monopoly/market dominant positions.
Increasing the availability of skilled workers is a key priority for enterprises. Basic education is	Provide universal access for four-year old's to early childhood education.

not providing a firm foundation for skills The VET system could better respond to labor demand.	Increase secondary school teacher training for teaching special needs students. Deepen the role of workplace training in vocational education and training provision. Invest more in coverage and quality of active labor market policies.
In spite of significant governance reforms, key integrity and anti-corruption institutions are not forming a coherent public integrity system, resulting in fragmented action and limited impact.	Provide the integrity and anti-corruption institutions with the necessary responsibilities, coordination mechanisms and resources to fulfil their role.
Judicial reform has made substantial progress, but accountability needs further strengthening and judicial independence needs to be safeguarded.	Implement an effective and transparent accountability mechanism for the Prosecutor General in line with international standards. Enhance judicial independence in relation to the probation period in appointing judges and the composition of the Supreme Judicial Council.
Several cases of vested interests between businesses and political elites have been identified in recent years. There is no regulation of lobbying activities and international rankings suggest challenges in ensuring media freedom.	Introduce lobbying regulation, including a code of conduct for the engagement of lobbyists with members of Parliament. Protect the independence of media to ensure the integrity of public decision-making processes.
Whistle-blowing mechanisms and protections are comparatively weak.	Implement the EU whistle-blower Directive and launch a campaign to enhance officials and the public's acceptance of whistle blowing.
Supporting decarbonisation of the economy	
Coal accounts for almost half of energy production and is an important source of high air pollution and greenhouse gas emissions. Pricing of the environmental costs of fossil fuels is uneven across sectors.	Gradually remove support for fossil fuels and align carbon prices for sectors outside of the EU Emissions Trading System (ETS), while protecting poorer households. Support reskilling and relocation of displaced workers in coal regions.
Energy efficiency is lower than in most OECD countries, notably in the residential building sector.	Continue to support housing renovation and improve targeting to low-income groups.

	Provide information about the benefits of energy saving investments to households.
Promoting regional development and improving inclusiveness	
Transport infrastructure is underdeveloped and lacks maintenance. The number of traffic fatalities is high.	Promote the connection of remote regions to national and international supply chains with investment in transport infrastructure and digital connectivity.
Municipalities have limited opportunities and incentives to collaborate on efficiency-improving service delivery.	Improve the system for inter-municipal co-operation by reducing regulatory barriers and enhancing fiscal incentives for efficiency improvements.
The flat personal income tax of 10% with no basic tax allowance combined with social security contributions places a high tax burden on lower-income households compared to other countries. Nonetheless, potential gains from a reform need to be weighed against the advantages of the current tax system.	Consideration should be given to reducing the tax burden for lower-income individuals in the medium or longer term.
Spending on social protection benefits is comparatively low and benefits are poorly targeted to the lowest income households, reflecting high non-take up combined with limited and ineffective means testing.	Relax entitlement criteria and increase generosity of social benefits. Streamline and simplify multiple and complex means-tested social benefit schemes, notably for families with children.

Many financial instruments have been used during the pandemic to ensure that companies cope with the restrictive measures and the problems they bring with them. There were various types of support from direct aid to funding of RDI projects as well as unemployment support for entrepreneurs and self-employed. The financial institutions also changed their payment plans and reduced their repayment plans to keep companies going despite the pandemic.

Direct aid
In the following there are short descriptions of the support that was offered for SMEs in Finland. Unfortunately, no data about the utilization of these aids in the region was available.

Business cost support
The aim of the business cost support has been to help SMEs in the difficult economic situation caused by the coronavirus. The support has especially been directed for tourism, restaurant and event sectors who have been affected by the restrictions. Since the outbreak of the pandemic there has been six rounds of business cost supports. The support could vary between 2000 EUR to 1 million EUR.

Closure compensation
Closure compensations has been directed for those companies who due to a provision of an Act or order of an authority, have to keep their premises closed in order to stop the spread of the coronavirus. Closure compensation applies to companies with fewer than 50 employees. The last compensations were made in February 2022. The compensation covered 100 % of wage costs and maximum 70 % of other inflexible expenses.

Event guarantee
The purpose of the event guarantee was to reduce the financial risk of organising events. The guarantee was an advance payment commitment given to event organisers for the costs the organisers declare. If the event is cancelled or its size restricted by law or order of an authority, compensation will be paid for the costs incurred. This funding is no longer available.

Support for sole proprietors
The form of support for sole proprietors was introduced at the beginning of the pandemic and was channeled through municipal business services. The maximum amount of aid was only EUR 2000.

Temporary support for rural enterprises and agriculture for financial difficulties caused by the coronavirus pandemic
The Finnish Food Authority started a temporary support for rural enterprises and agriculture to help companies whose financial situation has deteriorated due to market and production disruptions caused by the coronavirus pandemic. The support was intended to help companies adapt to the emergency conditions caused by the COVID-19 crisis and to continue profitable operations, and to secure jobs in the transition towards normal conditions.

RDI-support
The Governments package for businesses was estimated to be over 1 billion EUR in direct subsidies. Of the amount, 700 million EUR were directed via Business Finland and 300 million EUR via grants provided by centres for economic development, transport and the environment (ELY-center).

Business Finland Support
In April 2020 Business Finland started providing support for SMEs with over 5 employees and it was mainly focused on innovation and product development. Here the maximum amount of aid was EUR 100 000. The funding rate was 80 % of total costs of the project. The Financing serviced were provided for tourism and auxiliary tourism services, creative and performing industries and all sectors where subcontracting chains have been affected by the coronavirus outbreak.

ELY-Center Support
The Center for Economic Transport and the Environment also channeled crisis financing in the area to smaller companies with 1-5 employees. The support was also focused on development and innovation and subsidies could not be used directly for their own normal business activities. The funding rate was 80 % of total costs. Maximum amount of funding was 100 000 EUR.

AKKE - Supporting sustainable growth and vitality in regions
The Regional Council's in Finland started to fund development projects in Spring 2020 via the national AKKE-funding instrument. This support was directed for business developers and other RDI-actors to support the economic recovery from the crisis. Since 2020 almost 30 projects have been funded in the region. Many of the projects concentrated on giving SMEs support and tools to recover from the crisis and to develop businesses to grow and become more resilient. Sustainable development has also been key in many of the projects. The funding rate is 80 % of total costs of the project. The project budgets vary from 20 000 - 90 000 EUR.

Examples of funded projects:

- Developing businesses during the crisis
- Business models after corona-crisis
- Circular Economy and Climate Roadmap for South Ostrobothnia
- Climate roadmap for the South Ostrobothnia's Agri-Food Sector.

REACT-EU Funding
The Center for Economic Development, Transport and the Environment is managing the REACT-EU-ERDF funding for SMEs as well as the REACT-EU-ESF. The Regional Council of South Ostrobothnia is managing the REACT-EU-ERDF for RDI projects. The first regional REACT-EU projects started in the region in early 2021. Since twenty-tree (23) SMEs have received project funding under the REACT-EU-ERDF and 17 development projects have been started under the REACT-EU-ERDF. In addition, seven (7) ESF projects have been funded.

The key in the projects is to respond to the recovery of pandemic as well as strengthen the resilience of regional economy.

Some examples of the REACT-EU development projects.

- Green Grow - supporting SMEs in green and inclusive growth
- VITALI - Innovations of Green Economy - boosting collaboration between public and private sector
- Supporting Climate neutral Food Processes in Food SMEs
- TAKO - Working and living during pandemic - new solutions for adaptable and sustainable housing

Many of the SMEs who utilized the funds used it to improve the sustainability, circularity and carbon neutrality of their business and/or production processes.

GREECE

Preventing job losses and strengthening the capacity of healthy businesses to maintain their productive capacity is at the heart of government policies in Greece. In this regard, incentives for businesses to retain tourism employees, as well as government-led upgrades, can be widely used to mitigate potential long-term losses. Incentive measures for tourism businesses can be included in economic scale measures or be sectoral. Depending on the resources available, governments may consider using liquidity injections, insolvency prevention clauses, tax cuts, freezing payments and late interest, and other financial support measures. The special financial support to tourism service providers can be either direct (ie through special credit limits, soft loans, subsidies, etc.) or indirect (ie through tax breaks, interest deferrals and tax payments, etc.). In addition to providing financial support to businesses, governments must meet the immediate financial needs of laid-off, part-time and seasonal workers. They can be partially or fully offset through direct financial support or included in special training programs to enhance possible future employability (coupon systems, subsidized education, etc.). Some services, however, are benefiting from the crisis. This happens to information technology services, the demand for which has increased as companies allow employees to work from home and as people socialize remotely. At the same time, measures must improve productivity and ensure social cohesion. A first pillar on which governments can build is to support the development of skills for seasonal or part-time tourism workers. As unemployment rises, there may be concerns about the loss of qualified and experienced staff (Economic Chamber of Greece, 2021).

Governments can enhance the skills of tourism officials and take initiatives to accelerate the digital transformation of the industry. Learning vouchers, online education and knowledge transfer incentives can be integrated into lifelong learning strategies. In order to ensure coherence, it is important that these strategies are designed in close consultation with the private sector. In any case, international co-operation on the design and implementation of health protocols is vital to minimizing differences between states. This is particularly important for the tourism industry, ie the adoption of common health protocols or vaccination certificates. Finally, governments must work closely together to achieve regulatory convergence and the removal of barriers to international trade. As in previous crises, one can expect more safeguards from many national economies. International Organizations have been weakened both by the impossibility of concluding trade agreements, particularly within the World Trade Organization (WTO) but also by the ambiguity of pandemic policies and actions by the World Health Organization (WHO). If the state of their public finances and the size of their national economy allow it, governments are expected to try to save their "national champions" in order to avoid the disappearance of industrial or financial sectors that are strategic to the economy (Economic Chamber of Greece, 2021).

The Region of Central Macedonia, with the Program “Support of small and very small enterprises that were affected by Covid-19 in Central Macedonia” within the Operational Program "Central Macedonia 2014-2020" of 200 million Euros, supported 2,205 companies or in total 33% of the approved proposals. The contribution of the program to the GDP of the Region is important to cover fixed costs and the resumption of economic activity (Economic Chamber of Greece, 2021).

After the prolonged period of extensive restrictions on economic and social activity adopted to address the Covid-19 pandemic, the situation has improved. The lifting of restrictions in conjunction with vaccinations has created a positive climate for the course of business and the economy. The extension of support measures, such as the 3 new rounds of repayable advances (5, 6 and 7), the grants of the Regions, the fixed subsidy program and the special programs for the resumption of food services and tourism, showed that they covered a significant part of the business losses. The economic climate index of SMEs, after the extremely low performance recorded throughout 2020, showed a significant increase of 26.2 points in the first half of 2021 as it raised to 46.3 points (IMEGSEVEE, 2021).

The small and very small enterprises made extensive use of the support measures taken. The vast majority of companies (83.8%) used at least 1 of the support measures, while 1 in 3 companies (33%) used at least 3 of the support measures taken by the government. Repayable advances were considered by most small and micro enterprises (37.8%) as the most important support measure, a finding that shows that the most serious problem faced by enterprises was the lack of liquidity (IMEGSEVEE, 2021).

The outbreak of the Covid-19 pandemic and restrictions on economic and social activity to control the spread of the coronavirus have led to widespread use of teleworking or distance learning. The companies that could implement it were asked to adapt to a working environment unknown to them, given that according to EU. Greece had one of the lowest teleworking rates in the EU before the pandemic (5.3% of all employees). The new conditions created by the pandemic in combination with the changes taking place in the context of the so-called "4th Industrial Revolution", seem to have led to a further acceleration of the trends of "digital transformation" with an asymmetric effect on economic sectors and productive activities (IMEGSEVEE, 2021).

In the subsections that follow, an overview of recommendations as well as policy measures, incentives, and regulatory support for advancing sector-specific CE strategies in a post-COVID-19 world is presented (Ibn-Mohammed et al., 2021).

There are detected six main types of policy intervention to facilitate, advance and guide the move to a CE by addressing either barriers that aim to fix the market and regulatory failures or encourage market activity. Some of the policy intervention options identified include: (i) *education, information and awareness* that entails the integration of CE and lifecycle systems thinking into educational curricula supported by public communication and information campaigns; (ii) *setting up platforms for collaboration* including public-private partnerships with ventures at the local, regional and national levels, encouraging information sharing as well as value chain and inter-sectoral initiatives, establishing research and development to facilitate breakthroughs in materials science and engineering, biomaterials systems etc.; (iii) introduction of sustainability initiatives in *public procurement and infrastructure*; (iv) *provision of business/financial/technical support schemes* such as initial capital outlay, incentive programs, direct subsidies and financial guarantees as well as technical support, training, advice and demonstration of best practices; (v) *regulatory frameworks* such as regulation of products (including design), extension of warranties and product passports; strategies for waste management including standards and targets for collection and treatments, take-back systems and extended producer responsibility; strategies at the sectoral levels and associated targets for resource productivity and CE; consumer, competition, industry and trade regulations; introduction of standard carbon accounting standards and methodologies; and (vi) fiscal frameworks such as reductions of VAT or excise tax for products and services designed with CE principles (Ibn-Mohammed et al., 2021).

Next is the European Circular Bioeconomy Fund. The fund, which aims to raise € 250 million for bioeconomics and circular bioeconomics, invests in start-ups, state-of-the-art technologies that need funding to grow their business and expand into larger markets. Bioeconomics and circular bioeconomics are sectors that contribute very significantly to the sustainability of the economy and the protection of the environment. The bioeconomy reduces our dependence on natural resources by promoting sustainable products that use renewable biological resources (such as lupins) to produce food, materials and energy.

The European Circular Bioeconomy Fund was created following a study prepared by the European Investment Bank under the InnovFin - Consulting Services program, with the support of the European Commission. The study identified a significant gap in the financing of bio-economy companies that want to increase their production and expand their distribution network. The report recommended the creation of a venture capital fund to support companies in development. Thus, the European Investment Bank and the European Commission selected an investment consultant who created the European Circular Bioeconomy Fund (European Investment Bank, 2021).

The new Circular Economy Action Plan from March 2020 is the cornerstone of the European Union's efforts on resource use. The plan includes a wide range of actions addressing product design, circular economy processes, more sustainable consumption and waste prevention. It requires and specifies action in key product value chains, including electronics and ICT, batteries, packaging, plastics, textiles, buildings and construction, and food, water and nutrients. As such, it is one of the main components of the European Green Deal (the European Union's overarching response to environmental, climate and socio-economic challenges) and is of high relevance to give direction to the investments for both post-COVID recovery and a sustainable transition of our economic model (European Environment Agency, 2021).

ITALY

Mitigation measures and funding to react on COVID19 so far at regional level

A series of support measures for the economic activities most affected by the covid pandemic at national and regional level have been launched between 2020 and 2021.

As explained above, the categories most affected, especially during lockdown periods, were businesses for some manufacturing sectors, the retail except for the food sector, food service sector (i.e. bar, restaurants, fast food), the sports and the tourism facilities. In Emilia Romagna, as in the rest of Italy, some businesses in the manufacturing sector were closed during the lockdown period. Instead, the companies in the food sector together with companies in the health sector for the production of medical devices for the pandemic covid continued to remain open to ensure their production. Some companies, in order to cope with the crisis, have converted their production process to the production of medical devices such as covid masks or alcohol-based disinfectants.

At national level, the Government has provided for a series of support measures for businesses related to the COVID-19 emergency:

- support for economic activities closed in lockdown period and had a reduction in turnover

- support for the revitalisation of economic activities in the retail sector

- support for the tourism sector

- support for the culture and sports sector

- support also for freelancers

These support measures concern mainly incentives, non-repayable grants, tax relief.

The Ministry of Ecological Transition has defined an important measure to support the enterprises in this period of crisis due to the Covid pandemic and at the same time to promote initiatives of circular economy. The Ministry has launched a call for tenders for reimbursement in the form of a tax credit for expenses incurred in 2020 by companies for the purchase of products that derive at least 75% from recycling waste or scrap. The purpose of this facility is to support the spread of the circular economy and in particular to increase the use of recycled materials. The expected contribution is 25% of the purchase cost incurred, up to a maximum of €10.000. The budget available, while funds last, is 10 million euros.

In the Emilia Romagna Region economic resources have been allocated to support categories of enterprises in difficulty due to the Covid-19. Specifically in 2021, a call for tenders was published in 7 measures, aimed at companies that carry out the following activities:

1) discotheque and dance hall operators

2) enterprises engaged in trading in public areas at fairs and in itinerant restaurants

3) enterprises engaged in traveling theater

4) enterprises engaged in ice cream, pastry and other take-away and catering activities

5) Gymnasium operators

6) Enterprises operating in the film sector

7) cultural enterprises

The total economic resources available are 13.35.,000 euro.

In 2020 and 2021, the Region has also defined support measures to lower the cost of access to credit for SMEs (excluding agricultural sector) and freelancers, to encourage the recovery of the production system following the covid19 emergency. Specifically, it defined an interest subsidy to reimburse bank interest and intermediation costs for a maximum duration of 36 months.

Dedicated economic resources are addressed to help the sport sector and in the specific 4,5 million euros, of which 4 million euros will go to amateur sports associations and another 488.000 euros to amateur sports clubs. Each beneficiary will receive a one-off contribution of 4,000 euros, which will be reduced to 2.000 euros in the case of organizations that have already received other regional support as part of the measures to mitigate the difficulties arising from the Covid-19 emergency.

Other dedicated support measures were addressed to enterprises located in Mountain areas to support the purchase of machinery or the renovation of buildings.

The Emilia Romagna Region has allocated new approximately 30 million euros (February 2022) for new refreshments for some types of enterprises of the regional territory that have recorded decrease of turnover because of the Covid-19 pandemics and the consequent limitations that belong to the tourism, entertainment and culture sector.

Important measures to support the economic recovery of businesses from the negative effects of the covid pandemic will come from the Recovery Funds and the new programming of ERDF funds 2021- 2027. At regional level the new programming of ERDF funds 2021- 2027 includes measures dedicated to the circular economy and resource efficient use. These measures will support the funding of projects for development of industrial processes and of the facilities to the circular model and in general for the green transition of enterprises (EUR 4,3 Million).

Important measures to support the economic recovery of businesses from the negative effects of the covid pandemic will come from the Recovery Funds and the new programming of ERDF funds 2021- 2027.

The resources allocated in Italy's Recovery and Resilience Plan include measures dedicated to the ecological transition with particular reference to the circular economy. The plan is divided into 6 missions and mission 2 is dedicated to green transition. In this mission there are some investments to promote the circular economy in the Italian economic system. In the specific there are two specific investments dedicated to circular economy:

- **Investment 1.1 for Implementation of new waste management plants and modernization of existing plants** (EUR 1,5 billion) dedicated to public administrations. Targeted interventions across the national territory will resolve critical situations in metropolitan areas through the construction of new treatment and recycle plants and the technical improvement of existing ones. In addition, they will digitalise and improve the segregated waste collection system, involving citizens in the adoption of good practices in waste management. The interventions will not include investments in Mechanical Biological Treatment/Mechanical Treatment plants (TMB, TBM, TM, STIR, etc.) or incinerators, in compliance with the DNSH principle. It is worth mentioning that landfills as disposal facilities are not covered by the proposed measures

- **Investment 1.2 for Circular economy "flagship" projects** (EUR 0,6 billion) dedicated to enterprises. The component aims at the implementation of new projects for collection, treatment and recycle with a high innovative content, addressing the following strategic sectors covered by the European Action Plan on Circular Economy and Waste Directives:
- - Waste Electrical and Electronic Equipment (WEEE);
- - Paper/paperboard industry;
- - Plastic waste recycling (mechanical, chemical recycling, "Plastic Hubs");
- - Textiles ("Textile Hubs").

The calls dedicated to these investment measures have already been published.

Metropolitan City of Bologna
Information Webpage about Covid19 funding and measures for citizens and enterprises

Metropolitan City of Bologna, to help citizens and enterprises to collect the right information on funding and mitigation measures to react on COVID19, created a webpage, constantly updated, where it is possible to find all the information divided in different topics and with references to related national and regional laws: measures for work, fiscal and financial measures, income support, income support and social policies, tourism, culture and entertainment, regional exceptional and recovery measures, operational guidelines for the safety in the work places.[13]

[13] Here is the link: https://www.cittametropolitana.bo.it/portale/Home/Covid_Sostegno_a_imprese_e_lavoratori

CONCLUSIONS

After quoting all the above data, presented by the 4 countries that participate as partners in the project Interreg Europe CESME+, the situation that prevailed after the outbreak of the pandemic and the consequences are recorded in great detail.

In all 4 areas, the HoReCa and service sectors were mainly affected by the pandemic. The least affected sector was the industry, because in most cases it continued to operate almost normally. The Region of South Ostrobothnia, Finland, seems to have suffered the mildest consequences of the 4 areas and the recovery is in good point already.

In the environmental sector, the air quality improved a lot at the first semester of 2020, but this may be a temporal effect of the restrictive measures for the pandemic. On the other hand, the use of the private cars increased after the lifting of the measures.

The data that came out of the questionnaires and the surveys for the SMEs show that the circular economy and the sustainable development are high in their agenda towards the confrontation of the pandemic and the recovery. Many companies started new actions of CE during the pandemic and turned their operation as sustainable as possible. Resources and energy savings were much appreciated by the enterprises during the pandemic.

The capability of adaptation seems to be the key to respond to such crises in the future. The support tools of the Regions/Nations and the funds helped the SMEs a lot towards that direction.

Bibliography

BULGARIA

1.National Statistical Institute Reports on:

- **ACTIVITY AND CONDITION OF ACCOMMODATION ESTABLISHMENTS from March 2020 and ongoing**
- **SITUATION OF THE NON-FINANCIAL ENTERPRISES IN THE EPIDEMIC SITUATION from March 2020 and ongoing**
- **Statistics on environment**
- **Demographic reports**

2. Economic outlook Bulgaria – published by the Ministry of Finance January 2021

2. Assessment Report on the Impact of COVID-19 on Sofia's Economy, developed by the Digitisation, Innovation and Economic Development Department of Sofia Municipality (Innovative Sofia) and the Sofia Municipal Privatisation and Investment Agency (Invest Sofia)(2021)

3. Economic impact of COVID-19 pandemic: case of Bulgaria, Nikolay Sterev, University of National and World Economy – Sofia, Bulgaria, 2021

4. Impact of the COVID 19 Pandemic on the Development of Rural and Ecological Tourism in Bulgaria, Assoc. Prof. Dr. Gergana Slavova, University of Economics – Varna, 2021

FINLAND

Chapter 1:

Regional Council of South Ostrobothnia (2022). Statistics about South Ostrobothnia. Statistics website. https://epliitto.fi/tilastot/

Regional Council of South Ostrobothnia (2021). Welcome to South Ostrobothnia Brochure. Link: https://www.esitteemme.fi/epliitto_EN/WebView/

SYKE (2022). *HINKU Calculations - GHG emissions in Finnish municipalities and regions.* Websites: https://paastot.hiilineutraalisuomi.fi/

Finnish Climate Panel: Gregow, H., Mäkelä, A., Tuomenvirta, H., Juhola, S., Käyhkö, J., Perrels, A., Kuntsi-Reunanen, E., Mettiäinen, I., Näkkäläjärvi, K., Sorvali, J., Lehtonen, H., Hildén, M., Veijalainen, N., Kuosa, H., Sihvonen, M., Johansson, M., Leijala, U., Ahonen, S., Haapala, J., Korhonen, H., Ollikainen, M., Lilja, S., Ruuhela, R., Särkkä, J. & Siiriä, S-M., (2021). *Ilmastonmuutokseen sopeutumisen ohjauskeinot, kustannukset ja alueelliset ulottuvuudet. Finnish Climate Panel's report 2/2021.*

Chapter 2:

Statistic center Finland www.stat.fi

Finnish chamber of commerce www.kauppakamari.fi/en

Nordea Finland www.nordea.fi

Regional Council of South Ostrobothnia (2022). Statistics about South Ostrobothnia. Statistics website. https://epliitto.fi/tilastot/

Chapter 3: Environmental impacts

YLE. Online article about increase in the packaging waste at RINKI recycling points. Link: https://yle.fi/uutiset/3-12162403. Article was released on 19.10.2021.

Lakeuden Etappi. Online article and press releas about the increased visits in the recycling points of Lakeuden Etappi. Link: https://www.etappi.com/etapin-jateasemilla-ennatyksellisen-vilkas-vuosi/. Press release was released on 15.2.2021.

Lakeuden Etappi. Waste analysis of the combustible waste collected by Lakeuden Etappi. Press release and online article: https://www.etappi.com/biojatteen-maara-vaheni-pakkausjatteiden-maara-lisaantyi/. Press release was releases on 22.9.2021.

Ramboll (2021). Summary of the Study on effect of remote work to greenhouse emissions of traffic. Website address: https://fi.ramboll.com/media/rfi/etatyon-ja-liikenteen-uusien-palvelujen-vaikutus-kasvihuonepaastoihin. The article was released on 17.9.2021.

Chapter 4:

Seinäjoki University of Applied Sciences (2022). Results on the survey for SMEs. Business model's after the pandemic.

Chapter 5:

Ministry of Economic Affairs and Employment. Coronavirus: Guidance for Business. Online article. Link: https://tem.fi/en/coronavirus/guidance-for-businesses.

Ministry of Economic Affairs and Employment (2020). Press release: Government increases business financing due to COVID-19 and provides EUR 1 billion in direct subsidies. Link: https://valtioneuvosto.fi/en/-/1410877/valtion-rahoitusta-yrityksille-koronavirustilanteessa-vahvistetaan-yritystukiin-miljardi-euroa. Released 26.3.2020.

Eura 2014. List of REACT-EU funded ERDF-projects. Link here.

Eura 2014. List of REACT EU funded ESF-projects. Link here.

Regional Council of South Ostrobothnia. List of projects funded under AKKE. Link: https://epliitto.fi/rahoitetut-akke-hankkeet/

GREECE

Alpha Bank, Alpha Bank Economic Research. (2021). *Sectors in focus: Circular economy and applications in various sectors*.

CARSA, DIW econ, Executive Agency for Small and Medium-sized Enterprises (European Commission) Now known as, LE Europe, PwC, Muller, P., Cannings, J., Priem, M., Unlu Bohn, N., Lefebvre, V., Murphy, E., Aranda, F., Devnani, S., Smid, S., Gorgels, S., Frizis, I., Ladher, R., Ramos Illán, S., Hope, K., & Robin, N.

(2021). *Annual report on European SMEs 2020/2021: Digitalisation of SMEs : background document*. Publications Office of the European Union. https://data.europa.eu/doi/10.2826/120209

CCIT. (2022). *Lack of liquidity and increased energy costs plague companies—Greater optimism for 2022, compared to 2021, by companies—Current research of the CCIT on member companies*. https://www.ebeth.gr/pages/details/i-elleipsi-reustotitas-kai-to-auksimeno-energeiako-kostos-talanizoun-tis-epixeiriseis---megaluteri-aisiodoksia-gia-to-2022-enanti-tou-2021-apo-tis-epixeiriseis---epikairi-ereuna-tou-ebeth-se-epixeiriseis-meli-tou,38348

Economic Chamber of Greece. (2021). *Impact of the COVID pandemic in the Region of Central Macedonia*. https://pmdaae-pkm.gr/%ce%b5%cf%80%ce%b9%cf%80%cf%84%cf%8e%cf%83%ce%b5%ce%b9%cf%82-%ce%b1%cf%80%cf%8c-%cf%84%ce%b7%ce%bd-%cf%80%ce%b1%ce%bd%ce%b4%ce%b7%ce%bc%ce%af%ce%b1-covid-%cf%83%cf%84%ce%b7%ce%bd-%cf%80%ce%b5%cf%81/

Elafros, Y. (2021). *Covid protection hurts the environment | eKathimerini.com*. https://www.ekathimerini.com/society/1161521/covid-protection-hurts-environment/

Ellen MacArthur Foundation. (2020). The circular economy: a transformative Covid-19 recovery strategy

European Commision. (2021). *Greece—SME Fact Sheet 2021*. Ec.Europa.Eu. https://ec.europa.eu/growth/smes/sme-strategy/sme-performance-review_en

European Environment Agency (EEA). (2020). Information from Publication / COVID-19 and Europe's environment: impacts of a global pandemic. https://www.eea.europa.eu/articles/living-in-a-state-of

European Investment Bank. (2021). Report on the activities of the European Investment Bank for the year 2020: Solutions to the crisis.

Grant Thornton Greece. (2020). Study of the effect of Covid 19 on Greek Enterprises & the Greek Economy.

Hellenic Federation of Enterprises (SEV) and EY Greece. (2017). Medium and small enterprises in Greece / Part A: Contribution to the economy, challenges.

Hellenic Statistical Authority, 2021, https://www.statistics.gr/

Ibn-Mohammed, T., Mustapha, K. B., Godsell, J., Adamu, Z., Babatunde, K. A., Akintade, D. D., Acquaye, A., Fujii, H., Ndiaye, M. M., Yamoah, F. A., & Koh, S. C. L. (2021). AcriticalanalysisoftheimpactsofCOVID-

19 ontheglobaleconomyandecosystemsandopportunitiesforcirculareconomystrategies. *Resources, ConservationandRecycling*, *164*, 105169. https://doi.org/10.1016/j.resconrec.2020.105169

IMEGSEVEE. (2021, November 22). *IME GSEVEE 2021 Report: The impact of the pandemic on small businesses*. IMEGSEVEE. https://imegsevee.gr/%ce%b4%ce%b7%ce%bc%ce%bf%cf%83%ce%b9%ce%b5%cf%8d%cf%83%ce%b5%ce%b9%cf%82/%ce%ad%cf%81%ce%b5%cf%85%ce%bd%ce%b5%cf%82-%ce%bc%ce%b5%ce%bb%ce%ad%cf%84%ce%b5%cf%82/ekthesi-ime-gsevee-2021-o-antiktypos-tis-pandimias-stis-mikres-epicheiriseis/

INSETE. (2019). Annual Report on Competitiveness and Structural Adjustment in the Tourism Sector: Region of Central Macedonia. *Insete*. https://insete.gr/studies/ετήσια-έκθεση-ανταγωνιστικότητας-κα-8/

Kottarides, K. (2020, May 11). *Circular economy and small businesses*. IMEGSEVEE. https://imegsevee.gr/%ce%b4%ce%b7%ce%bc%ce%bf%cf%83%ce%b9%ce%b5%cf%8d%cf%83%ce%b5%ce%b9%cf%82/%ce%ba%cf%85%ce%ba%ce%bb%ce%b9%ce%ba%ce%ae-%ce%bf%ce%b9%ce%ba%ce%bf%ce%bd%ce%bf%ce%bc%ce%af%ce%b1-%ce%ba%ce%b1%ce%b9-%ce%bc%ce%b9%ce%ba%cf%81%ce%ad%cf%82-%ce%b5%cf%80%ce%b9%cf%87%ce%b5%ce%b9%cf%81%ce%ae%cf%83%ce%b5%ce%b9%cf%82/

Labor Institute of the General Confederation of Greek Workers (INE GSEE). (2021). Employees and jobs in Central Macedonia: Resiliency, uncertainty and professions in the post-pandemic era (Part A). https://www.inegsee.gr/

Naidoo, R., & Fisher, B. (2020). Reset Sustainable Development Goals for a pandemic world. *Nature*, *583*(7815), 198–201. https://doi.org/10.1038/d41586-020-01999-x

Thessaloniki Transportation Project Organization. (2020). *TTPO INVESTIGATION ON THE IMPACT OF Covid-19 ON TRANSPORTATION BY PUBLIC TRANSPORT IN THESSALONIKI*. http://oseth.com.gr/%ce%b5%cf%81%ce%b5%cf%85%ce%bd%ce%b1-%cf%84%ce%bf%cf%85-%ce%bf%cf%83%ce%b5%ce%b8-%ce%b3%ce%b9%ce%b1-%cf%84%ce%b9%cf%83-%ce%b5%cf%80%ce%b9%cf%80%cf%84%cf%89%cf%83%ce%b5%ce%b9%cf%83-%cf%84%ce%bf%cf%85-c/

Varotsos, C., Christodoulakis, J., Kouremadas, G. A. & Fotaki, E.-F (2021). The Signature of the Coronavirus Lockdown in Air Pollution in Greece, Water Air Soil Pollut. 232:119

Vătămănescu, E.-M., Dabija, D.-C., Gazzola, P., Cegarro-Navarro, J. G., & Buzzi, T. (2021). Before and after the outbreak of Covid-19: Linking fashion companies' corporate social responsibility approach to consumers' demand for sustainable products. Journal of Cleaner Production, 321, 128945. https://doi.org/10.1016/j.jclepro.2021.128945

World Health Organization (WHO). (2020). News release: *Shortage of personal protective equipment endangering health workers worldwide*. https://www.who.int/news/item/03-03-2020-shortage-of-personal-protective-equipment-endangering-health-workers-worldwide

ITALY

Città Metropolitana di Bologna, Bologna Piano strategico metropolitano (2016a) "Report demografico. Sintesi delle tendenze demografiche nella Città metropolitana di Bologna Anno 2016"

https://psm.bologna.it/Engine/RAServeFile.php/f/News/Q4-Report_demografico_%28doppia_pagina%29.pdf

Città Metropolitana di Bologna, Bologna Piano strategico metropolitano (2016b) "Il posizionamento di Bologna. La città metropolitana di Bologna si confronta con le altre città italiane ed europee"

https://psm.bologna.it/Engine/RAServeFile.php/f/News/Q3Posizionamento_Bologna_%28doppia_pagina%29.pdf

Camera di Commercio di Bologna (2021) "I numeri dell'inizio della ripresa"
https://www.bo.camcom.gov.it/it/blog/bologna-i-numeri-dell%E2%80%99inizio-della-ripresa

https://www.bo.camcom.gov.it/sites/default/files/statistica-e-studi/Presentazione%20Quadro%20economico%201%20TRIM%202021.pdf

Confindustria, Cerved (2021) "Rapporto regionale PMI 2021", EDITORE CONFINDUSTRIA SERVIZI SPA, Roma, available on https://know.cerved.com/wp-content/uploads/2021/05/RAPPORTO-REGIONALE-PMI-2021_DEF.pdf

Servizio Studi e Statistica Città metropolitana e dell'Ufficio di Statistica del Comune di Bologna (2021) "Atlante metropolitano".
http://inumeridibolognametropolitana.it/atlantemetropolitano/economia/imprese

Servizio Studi e Statistica Città metropolitana e dell'Ufficio di Statistica del Comune di Bologna (2021) "Le imprese nella città metropolitana di Bologna 2020".

http://inumeridibolognametropolitana.it/studi-e-ricerche/le-imprese-nella-citta-metropolitana-di-bologna-2020

Documento strategico regionale per la programmazione unitaria delle politiche europee di sviluppo 2021-2027, aprile 2020, Regione Emilia-Romagna.

https://fondieuropei.regione.emilia-romagna.it/fondi-strutturali/temi/programmazione-strategica-2021-27

Commercio e mercato del lavoro in Emilia-Romagna, Novembre 2021 , ART-ER

https://imprese.regione.emilia-romagna.it/commercio/temi/osservatorio-commercio/studi-e-ricerche

Greenitaly 2021, Symbola

https://www.symbola.net/ricerca/green-italy-2021/

La mobilità durante la pandemia, aprile 2021, ART-ER

https://www.art-er.it/2021/06/la-mobilita-durante-la-pandemia-2/

La Gestione dei rifiuti in Emilia-Romagna, 2020, ARPAE - Regione Emilia-Romagna

https://ambiente.regione.emilia-romagna.it/it/notizie/attualita/2021/copy_of_marzo/la-gestione-dei-rifiuti-in-emilia-romagna

Studio preliminare degli effetti delle misure covid-19 sulle emissioni in atmosfera e sulla qualità dell'aria nel bacino padano, Giugno 2020, progetto life PREPAIR.

https://www.lifeprepair.eu/wp-content/uploads/2020/06/COVIDQA-Prepair-19Giugno2020_final.pdf