

# TOWARDS THE CIRCULAR ECONOMY IN CROATIA - THE PERSPECTIVE OF EU GREEN DEAL ON REGIONAL LEVEL

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**Abstract** Since the European Commission launched the Circular Economy Package in December 2015 named “Closing the loop: EU Action Plan for the Circular Economy”, many changes are expected both in European Union economy as well as in the Member States’ national economies. Due to new Package, a transposition of legislation is required as well as adjusting the business climate and citizens’ habits in order to fully implement the Package and experience the benefits of Circular Economy in Europe. The transition to a new economy pattern Commission perceived as essential due to new economic, global and environmental challenges. Assessing the waste management, the data showed that some member states already recycle almost 80 % of waste, while others are far away from achieving the Europe 2020 Strategy goals, including Croatia. The Circular Economy Package is nowadays part of EU Green Deal, one of the highest ranked strategic documents, which emphasizes the need for efficient use of resources by transition to the clean circular economy approach as well as to renew the biodiversity and to decrease the pollution. The authors analyse legislative framework and trends in green economy, with special attention on Croatia, and Primorje-Gorski Kotar county. This paper emphasizes the significance of the Circular Economy and its benefits and present the policy implementation capacities on the national and regional level to implement the circular approach to economic process.

**Keywords:**

circular,  
Economy,  
EU Green Deal,  
Primorje-Gorski  
Kotar County,  
recycling,  
waste  
management,  
small and  
medium  
enterprises.

## 1 Introduction

Since the European Commission launched the Circular Economy Package in December 2015, the public was introduced a new economy approach to production, consumption and deposit of wide range of different materials. Since the global economic and financial crisis in the European Union started in 2008, the lack of investments has been noticed - almost 15 % less investments in Europe than in pre-crisis levels. Moreover, the unemployment issue, especially among youth, became the top political priority. All these issues affected the economic growth. Therefore, the European Commission in 2014 set ten political priorities to trigger the economic growth by 2020 and to get back Europe to the growth, competitiveness and employment path, as it was in the pre-crisis level. Beside investments, the potential to generate growth and in the same time preserve the resources lie in the new approach to production and economy - the Circular Economy. In the lack of resources and due to aggressive pollution, an adequate solution that will support the political priorities and protect the environment was required. A good example is the European Union Environment Policy. Thirty years ago, first legal basis date ever since Single European Act (1986) and got its' complete structure in Maastricht Treaty. Environment is therefore, *par excellence* EU policy "which obliges Europe to speak and act unanimously after it has made a common decision." (Laiidi, 2014). It is, though, unquestionable that the EU is a global leader in environment protection; the role of the EU in the Paris Agreement (2015) ratification process - a huge EU political achievement in fight against climate change, as well as strong presence at the COP22 conference in Marrakesh, Morocco (2016), is unavoidable. Moreover, it is nowadays the essential part of the EU Green Deal Strategy, the main strategic framework for the future of the EU in this decade. To contribute to understanding and getting the full benefit of the circular economy, the term itself, the transition from linear approach and the state of implementation of the circular economy in Croatia as well as on the regional level, on the example of Primorje-Gorski Kotar County will be analysed in this paper.

## **2 Towards the circular economy - what it stands for?**

To reach the full potential of this paper, emphasizing the theoretical and legal determinants of circular economy, green economy and provides an overview of green technology trends. It is estimated that the Circular Economy Package, once transposed into national legislation and implement it correctly, will have a positive impact, not only for EU economy, but also the business sector and all citizens as well. Despite all non-conformities with the EU legislation and difficulties Croatia faces in aspect of investing in environment as well as enhancing the circular economy pattern, Croatia, among others, has a huge potential to benefit from the circular economy, especially driven by entrepreneurship.

### **2.1 Theoretical background**

The Circular Economy, according to Wysokińska (2016), is “an economy in which the production and consumption are organized in such a way that a value of products, components, materials and resources is maintained within the value chain and products life - cycle.”. Once a resource enters the production cycle, it should not be used and discarded, on contrary. It should be maintained in the production cycle, as many times as possible. The principle “reduce, reuse and recycle” (ibid.) is supposed to influence not only the production system, but also the citizens’ habits. The definition accepted by European Parliament is more or less similar: an economic model based on sharing, leasing, reuse, repair, refurbishment and recycling, in an (almost) closed loop, which aims to retain the highest utility and value of products, components and materials at all times (Bourguignon, 2016.). The idea of circular economy is not new, but it followed several other historically determined phases. The simple production mechanism, as Professor Gerd Winter from University of Bremen named “cyclical economy”, refers to the use of natural resources but also allowing the self-regeneration (Winter, 1989). This principle could be easily compared to agriculture: when lands seasonally lie fallow. The next phase is perceived as mechanical phase, since the nature is just the source for exploitation of resources - with very broad tolerance limit regarding damage committed to environment (ibid). While the allocation of resources was still a priority in the previous phase, the third phase, so-called “Nature Management”, refers more to environment protective approach, but still not sufficient. All mentioned phases have one common characteristic: approach to resources is quite linear, consisting of the

exploitation of raw materials, which in production process have been transformed and then distributed. Once put on the market, they are supposed to be consumed and turned into the waste. It is quite opposite of circular pattern; 'take- make- consume- throw away' pattern is characteristic for linear model. In many scholars' discussions, the circular model is often linked with the concept of Green Economy referred to the "resilient economy that provides a better quality of life for all within the ecological limits of the planet" (Denona Bogović, Drezgić, Čegar, 2016), meaning that growth should be driven by both public and private investments that reduce pollution and enhance the resource and energy efficiency (ibid). The EU, in the Europe 2020 Strategy for Smart, Sustainable and Inclusive Growth, has recognized green economy as valuable concept for the long-term growth and development (Denona Bogović, Šverko Grdić, 2020).

Nowadays, the Circular Economy is essential part of economic recovery of the EU. The Commission has adopted the Circular Economy Action Plan<sup>1</sup>, one of the main components of the new EU Green Deal, which seeks to prepare the economy for a green future, strengthen competitiveness, protect the environment and enhance new consumer rights. The Deal states that it is necessary to transform the EU's economic systems to a "contemporary, resource-efficient and competitive economy that, by the year 2050, has achieved net zero greenhouse gas emissions, that economic growth is not connected to resource use and that no single person or region are neglected" (ibid). Related to the latter, the European Parliament in November 2020 voted the Circular Economy Opinion<sup>2</sup> aimed at ensuring longer life of the devices we purchase, to reduce pollution and allow consumers to get the best value for their money. It is necessary to reduce the total amount of waste and understand the broader context, the connection between the need for circular management, the need to mitigate the harmful effects of climate change, as well as the need to reduce greenhouse gas emissions and the general need for transition to a green economy as a new and more sustainable economy model on the global level. According to Denona Bogović and Šverko Grdić (2020), a prevailing number of experts see the transition towards a green economy as a solution to overcome economic, social and

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<sup>1</sup>A new Circular Economy Action Plan ([https://eur-lex.europa.eu/resource.html?uri=cellar:9903b325-6388-11ea-b735-01aa75ed71a1.0017.02/DOC\\_1&format=PDF](https://eur-lex.europa.eu/resource.html?uri=cellar:9903b325-6388-11ea-b735-01aa75ed71a1.0017.02/DOC_1&format=PDF) (accessed on 20 December 2020))

<sup>2</sup> Opinion of the Committee on the Internal Market and Consumer Protection addressed to the Committee on the Environment, Public Health and Food Safety on a new Action plan for the social economy (2020/2077 (INI)), [https://www.europarl.europa.eu/doceo/document/IMCO-AD-652282\\_HR.pdf](https://www.europarl.europa.eu/doceo/document/IMCO-AD-652282_HR.pdf) (accessed on 20 December 2020)

environmental issues that have arisen as consequences of how economic systems have worked so far.

## **2.2 Green Technology trends**

Today, successful companies are increasingly turning to clean or so-called green technologies where renewable energy sources are increasingly used. In the field of waste management, maximum use is made of energy from waste materials, with a separate collection and recycling of a significant number of waste-generated raw materials. In addition to energy and waste potentials, there is a growing influence on the use of smart solutions and clean technologies with the achievement of energy efficiency in transport, construction of buildings, plants, but also in wastewater disposal. Efficient power generation systems are being developed using wind turbines, photovoltaic cells, photothermal cells, the use of wave energy, gas and low tide energy, and less and less classical energy sources such as coal and oil are being used. According to the Croatian Environmental Protection and Energy Efficiency Fund, today traffic accounts for 30 % of total energy consumption and about 25 % of EU greenhouse gas emissions, of which 71,3 % is generated by road transport. In the field of transport, hybrid and electric vehicles are increasingly being developed, towards the increase of vehicle autonomy with energy savings and increasing safety in both passenger and freight transport. Through various funds, especially through the European Structural and Investment Funds (ESIF), the use of green technologies and environmental protection is a priority. The main objectives of the funding are the preservation and protection of the environment and the promotion of resource efficiency. In addition, one of the strategic goals of this policy is to raise the living standards of citizens and promote sustainable and balanced development, and thus improve public health.

The Global Green Economy Index (GGEI), launched in 2010<sup>3</sup>, is used to measure performance, identify areas in need of improvement, and present it to various stakeholders to promote development. GGEI is also useful as a basis for creating customized sustainability measurement frameworks for a wide range of

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<sup>3</sup> <https://www.circonomist.com/resource-efficiency/global-green-economy-index-2018/>  
(accessed on 18 December 2020)

stakeholders<sup>4</sup>. According to Gavrić and Mitrović (2019) using four basic indicators (environmental tax by economic activities, material reuse, renewable energy in gross energy consumption and trade in recyclable raw materials) it is possible to calculate the GGEI of individual countries. In their research, they made a step further, comparing the correlation between GGEI and the Global Competitiveness Index (GCI). The GCI index calculation methodology is based on several different areas of competitiveness, sorting countries according to development and assigning appropriate weights. Taking into account the factors of innovation and sophistication, i.e., the level of business sophistication and research and development of innovations, and their correlation with GGEI, the authors concluded that acting on the principles of green economy leads to strengthening economic competitiveness. Environmental protection may not be the dominant factor in global performance, but it definitely is a contributing factor. Comparing the EU Member States, according to the combination of the GGEI and GCI, Germany, Sweden, Netherlands, France, Austria, Finland, Denmark and Belgium are highlighted as positive examples. On the other hand, the countries that are in the initial phase of green economic development, and which also show a lower level of competitiveness are Croatia, Romania, Slovenia, Lithuania, Bulgaria, Poland, Greece, the Czechia and Portugal. Possible reasons for the poorer index results include inadequate green policies, infrastructure deficiencies, underdeveloped financial tools, insufficient use of renewable energy sources and the potential of the circular economy. This approach is not only evident from macro-perspective; according to DiSegni, Huly and Akron, the companies that practice social responsibility and environmental sustainability are benefiting higher profits than those of the specific industry (DiSegni, Huly and Akron in Denona Bogović, Šverko Grdić 2020).

### **3 Analyses of economic and financial indicators of green technology sectors in croatia**

Since being the full EU member state, Croatia has had a potential to adapt, not only to a new financial resource gained from the EU membership, but also to adequately adopt new standards and goals EU requires for the sustainable growth. Nevertheless, Croatia still faces serious issues regarding the absorption of the ESI funds; until

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<sup>4</sup> EU progress on resource efficiency and green economy 2020 -Technical report (2020), <https://op.europa.eu/en/publication-detail/-/publication/cc781007-6fdc-11ea-a07e-01aa75ed71a1/language-en> (accessed on 18 December 2020)

January 2021 according to the European Commission, Croatia received 4,058,542,188 EUR of total EU payments, which is only 45 % of total allocation for the seven-years period. Croatia is therefore, on the bottom of the EU member states list, slightly “better” than Italy which received 44 % of total EU payments in the same period. Still, despite the available resources, Croatia faces implementation deficit while the possibilities of Circular Economy and importance of green investments in Croatia could be a significant boost to the Croatian economy.

### 3.1 Circular Economy in Croatia

To boost the EU’s growth potential and to achieve the environmental protection goals, the transition to the circular economy was reasonable policy action. The Action Plan on Circular Economy includes a target for recycling 65 % of municipal waste by 2030, a common EU target for recycling 75 % of packaging waste by 2030, and a binding landfill target to reduce landfill to maximum of 10 % of municipal waste by 2030 (COMM, 2015). In 2014, eight Member States landfilled more than 70 % of municipal waste, while seven Member States landfill less than 10 % of waste. The EU average was 28 % (Bourguignon, 2016). In 2014, there has been a decrease of the municipal waste disposed on landfills in the EU, from almost 67,113,000 tons in 2014 to 52 million tons in 2018 (Eurostat, 2021)<sup>5</sup>. In Croatia for instance, in 2016, there was 1,679,765 tons of deposited municipal waste (decrease of 2 % related to previous year), of which 1,288,386 tons of municipal waste has been deposited to landfills (Croatian Bureau of Statistics, 2018). According to Denona Bogović and Šverko Grdić (2020) when it comes to implementing a circular economy, Croatia was ranked 20th in 2017, which is 72 % below the EU average per the eco innovation index. A circular material flow is a key indicator of the implementation of a circular economy, and in Croatia in 2016 it only amounted to 4,4 %, while the EU average was 11,7 %. The European Commission estimated that, with full implementation of circular model, it would be possible to earn from 270 billion EUR to 600 billion EUR in material saving (Cotae, 2015). Moreover, the proper implementation and increase of resource efficiency, it could generate more than 2 million new jobs up to 2030 and over 1 % of GDP increase in the EU<sup>6</sup>. To achieve the benefits, the

<sup>5</sup>[https://ec.europa.eu/eurostat/statisticsexplained/index.php/Municipal\\_waste\\_statistics#Municipal\\_waste\\_generation](https://ec.europa.eu/eurostat/statisticsexplained/index.php/Municipal_waste_statistics#Municipal_waste_generation) (accessed on 16 January 2021)

<sup>6</sup> [http://ec.europa.eu/environment/enveco/resource\\_efficiency/pdf/RMC.pdf](http://ec.europa.eu/environment/enveco/resource_efficiency/pdf/RMC.pdf) (accessed on 16 January 2021)

Commission proposed legislative procedures<sup>7</sup> on several related areas. Since the goals for sustainable economy and benefits of its measures are generally accepted, the implementation is facing more difficult challenges the Commission should respond to. In the initial phase, while assessing the opinion of national parliaments regarding the Package, for example in Croatian Parliament, there have been several suggestions for revision regarding the Package outcomes. While preparing the Opinion on Circular Economy Package, Committee on Environment and Committee on European Affairs of the Croatian Parliament<sup>8</sup> expressed divided opinion. While accepting and supporting the proposal in general, as it was stated, Croatia probably will not achieve the goals on recycling the municipal waste. Since there was no legislation on food waste management, according to the Committee, Croatia could not achieve the EU goals on reducing the food waste. A lack of investments in waste and energy sector in Croatia is also difficult circumstance. The gross investments in water supply, sewerage, waste management and remediation activities in 2013 were approximately 2,328,817,000 HRK, which is 5,78 % of all investments, while the largest investments were still in construction and manufacturing sector (Croatian Bureau of Statistics, 2015). Considering all mentioned circumstances, the Committee warned on the possible failure on achievement of the Directive objectives. According to the Parliament opinion, Croatia is fully committed and supportive towards circular economy, while in the same time also expressing the lack of possibilities to fulfil the common measures. To avoid high cost of failures, the Croatian Parliament advises to exercise more flexible approach to policy implementation. From 2014, the situation both in legislative and implementation terms in Croatia remained mostly the same. Like the Croatian Parliament, the European Commission has also recognized the difficulties in implementation of the EU policies on environment, waste, food management and other areas. The Commission issued the Letter of Formal notice<sup>9</sup> regarding non-conformity of Croatian legislation with the rules<sup>10</sup> on the assessment of the effects of certain public and private projects on the environment. Furthermore, the

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<sup>7</sup> The Directive on waste (amending Directive 2008/98/EC on waste), proposal for the Directive amending Directive 94/62/EC on packaging and packaging waste, proposal for the Directive amending Directive 1999/31/EC on the landfill of waste and proposal for Directive amending Directives 2000/53/EC on end-of-life vehicles, 2006/66/EC on batteries and accumulators and waste batteries and accumulators, and finally, the Directive 2012/19/EU on waste electrical and electronic equipment.

<sup>8</sup> Opinion of the Committee on Environment and the Committee on European Affairs (DEU 14/30, 2014), 2 October 2014.

<sup>9</sup> On 8 December 2016

<sup>10</sup> Directive 2011/92/EU of the European Parliament and the Council



Commission issued the Reasoned Opinion regarding the failure of implementation of waste management policy in Biljane Donje where „...the Croatian authorities failed to classify that material as waste in line with EU rules on waste<sup>11</sup>, approximately 140,000 tons of this potentially harmful stone aggregate are deposited directly on soil, with consequences for human health and the environment.”<sup>12</sup>. To highlight the implementation deficit issue, from 2013 to 2016, the Commission issued 27 infringement cases in environment policy against Croatia. On the other side, in 2017 Croatia recorded 27,3 % in gross direct consumption of renewable energy sources while the EU average was 17,5 %, indicating that the goal of increasing that share to 20 % by the 2020 was achieved (Denona Bogović, Šverko Grdić, 2020). But this achievement, remarkable for Croatia, are partly the result of reduced industrial production, having in mind there are not so many significant pollutants in Croatia that could influence the environment by a large scale. The most recent document—the National Development Strategy until 2030, which is expected to be put in force soon, sets the priority named “Green Croatia” which indicated that regulatory framework concerning the transition towards a green economy should be developed (Denona Bogović, Šverko Grdić, 2020).

### **3.2 Green Investments in Croatia**

Being the EU member state, Croatia is fully able to absorb the ESI Funds for the period 2014 to 2020 and various projects using green technologies have already been funded. According to the waste management plan in Croatia, the construction of 11 waste management centres has been planned. Transshipment stations and procure communal vehicles for waste transport according to the latest available technologies were also planned to be built. Several wastewater disposals are also funded and intensified activities can be expected in the future and can be supported by local and regional administrations, public institutions and entities, companies, civil society organizations, citizens and others.

The Green Technology, Energy and Waste Management Sector has a total of 51,125 employees in 7,912 entrepreneurs in Croatia which shares 5,2 % of the total number of employees in Croatia and participates with 5,7 % in the total number of entrepreneurs, of which 6,2 % are marked as successful entrepreneurs. Among

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<sup>11</sup> Directive 2008/98/EC

<sup>12</sup> Commission Monthly Infringement Package, November 2016 (MEMO-16-3644, 2016)

others, 991 entrepreneurs are investors in the sector and they have a share of 7,6 % of total number of entrepreneurs in Croatia. There are also 5,4 % of exporters in the sector. Analysing the financial indicators, the sector of Green Technology, Energy and Waste Management has a share of 4,4 % of revenues and generates a profit of 5,9 % in Croatian economy. Average gross monthly wages in the sector are 11,6 % higher than the average. The trade balance is 22 % of the sectors' share. Moreover, it generates 6,4 % of newly created value, while profit per employee is higher by 12,8 % than the average, and newly created value per employee is as much as 21 % higher than the average<sup>13</sup>.

#### **4 Analyses of the green technology, energy and waste management sector in the primorje-gorski kotar county**

According to the Croatian Bureau of Statistics estimations for 2018, the Primorje-Gorski Kotar County with population of 282,730 inhabitants is the fifth county in terms of population, and in 2017 the County's GDP per capita was 14.526 EUR, making which makes the County third developed region in Croatia, just after the City of Zagreb as capital and Istria County. Being one of the most developed Croatian regions, the county is significantly positioned in the sector of Green Technology, Energy and Waste Management, where most of the county's indicators have a share of more than 10 % in Croatia in 2019.

##### **4.1 Statistical overview<sup>14</sup>**

The sector of Green Technology, Energy and Waste Management in the Primorje-Gorski Kotar County is very propulsive. In 2016, there was a significant decline in the number of investors, from 184 to 123, to reach 134 investor entrepreneurs in 2019. The number of importers, as well as the number of exporters, is growing slightly. Average monthly salaries are growing continuously which in 2019 was up to 7,379 HRK, and is higher both than the average national monthly salary one in the sector. The size of gross investment in new fixed assets is very significant for the sector: these investments amounted to 987.05 million HRK, compared to the total sectors score of 1,610.2 million HRK. It is usually divided into four areas: (1) Energy and Waste Management, (2) Transport, (3) Buildings and Infrastructure, (4) Water.

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<sup>13</sup> Data processed by authors according to Croatian Financial Agency-FINA, accessed 23 November 2020.

<sup>14</sup> *ibid.*

In the area of Energy and Waste Management, in 2019, there were 65 entrepreneurs and 649 employees. The number of entrepreneurs is gradually increasing, followed by an increase in the number of employees in the period 2015 - 2019. Significant gross investments in new fixed assets were realized in 2017 of almost 282 million HRK. The most significant active entrepreneurs in the field of Energy and Waste Management in the county in 2019 are METIS d.d. and IND - EKO d.o.o. which participate with more than 50 % of revenues in the county, followed by EKOPPLUS d.o.o., the company that manages the Centre for Waste Management "Marinščina".

There is a relatively large number of entities and employees in the area of Buildings and Infrastructure. In 2019, there are 642 entrepreneurs with 2,808 employees in this area while an increase over 20 % in the past five years in the number of employees was noted. In this area, there is a significant increase in the newly created value of almost 200 million HRK over five years.

The largest newly created value was generated in the area of Buildings and Infrastructure - as much as 683,95 million HRK in 2019, and in the Green Technology, Energy and Waste Management sector the total newly created value was 1,468 billion HRK. This trend was accompanied by an increase in newly created value per employee, from 214,848 HRK in 2015 to 243,570 HRK in 2019; also, almost doubled the profit per employee, which in 2015 amounted to 24,331 HRK and in 2019 went up to 47,057 HRK.

Only 11 entrepreneurs operate in the area of Water, which employ 787 people, mainly public utility companies. The total revenues of the area are entirely generated in the county and are gradually increasing in the observed period: 324,93 million HRK in 2015 to 378,73 million HRK in 2019. Average monthly wages per employee are lower than sectoral, but are gradually growing.

The Transport area generated a loss in 2019, but at the same time it achieved the highest positive trade balance of all areas and is the only area that generates more revenue from sales abroad than from sales in the country. It is greatly influenced by activities related to maritime affairs, but also to other activities through value chains. Given the combined development of the maritime, tourism and real estate markets, the Building and Infrastructure area is proving to be very propulsive. Maritime as a traditional branch has a direct and indirect impact and is a strong driver of

development of the entire county. Most entrepreneurs are in the area of Buildings and Infrastructure, where 50 % of the total number of employees in the sector achieve the highest profit per employee (up to 47,057 HRK), and also generate more than 43 % of total revenue with by far the highest profit of all areas (132.1 million HRK). Among all areas, they score the highest newly created value, up to 683.9 million HRK, although the newly created value per employee is the lowest. This area has an intensive import activity and generates 70 % of the total county's imports of this sector. In the area of Water, the largest investments are in new fixed assets, and in addition to the area of Energy and Waste Management, it achieves the highest newly created value per employee. Since significant EU funds have been invested in this area for the construction of drainage and wastewater treatment systems, the largest investments in new fixed assets have been made. These areas are most strongly influenced by maritime-related activities which achieved the most significant growth as a traditional branch and a strong driver of development of the entire county while the maritime-related activities.

#### **4.2 Case study of the Primorje-Gorski Kotar County**

Integrated waste management system is one of the strategic waste management goals in the Primorje-Gorski Kotar County. It is based on reducing the amount of waste produced at the place of its generation, the use of valuable ingredients for material and / or energy purposes and permanent disposal with strict application of applicable regulations in Croatia and the EU. It is based on a hierarchical, so-called AED concept (Avoidance - Evaluation - Disposal) of waste management, which requires that after primary selection valuable components of waste (plastic, glass, paper, cans) are used in an appropriate manner (recycling, recovery), and all other unsorted municipal waste is mechanically - biological treated (MBT). The remaining, stabilized waste in minimal quantities (up to 30 % of the input volume) is permanently disposed of in the landfill space, which must have a lower sealing layer to protect the groundwater.

In 2018, 25,30 % of waste was collected separately (over 56 % on the island of Krk). Although all local administrations in the County invest in equipment and vehicles for separate waste collection, as well as in educational and information activities, it will still take a lot of effort to reach the national target of 60 %. Further development of the separate waste collection system should be directed towards the selection of

separately collected waste and separate collection of biowaste. In order to increase the efficiency of separate waste collection, additional investments are forthcoming, especially in information systems for monitoring waste collection and treatment. Looking at the state of separate collection of municipal waste by local administrations, the City of Krk is absolutely in the lead in terms of separation rate (62,70 % compared to City of Opatija 4,05 %) and was the first who separate and recycle waste. The City of Rijeka, as the County capital and largest city in the region, has a waste separation rate of only 10,48 %. Every city and municipality on the island of Krk has a waste separation rate of over 45 %, unlike all the others in the region.

The reduction of municipal generated waste will depend on the implementation of planned measures, but also on economic growth (especially in tourism) and population trends. The importance of tourism for the Croatian economy, as well as for the county is evident—tourism expenditures over the total national GDP are 22,8 %, while the direct tourism impact on the GDP is 11,4 %, and tourism employs 8,2 % of the workforce. It is a huge source of environmental pollution (Denona Bogović, Šverko Grdić, 2020). According to data, in 2019, there has been 15,314,671 tourist nights in Primorje-Gorski Kotar County recorded, of which 91,59 % were made by foreign tourists (Croatian Bureau of Statistics, 2020), showing the significance of tourism, not only to the national, but also to the regional economy as well. According to the authors (Ogbeide, 2012 in Kovačić et al, 2019), practices such as saving water, saving energy and reducing solid waste are three of the most common things which are very welcome in hotel industry. It is obvious that tourism has to switch to alternative, long-term, sustainable and responsible forms. This indicates that built and new green hotels are in position to implement good practices in their business and help to environment. All of the mentioned arguments emphasize the need to transform the Croatian tourism sector to a so-called green tourism, in order to significantly reduce the pressure that tourism exerts on the environment in the future (Denona Bogović, Šverko Grdić, 2020).

The construction of a network of recycling yards has already started. There are 12 recycling yards in the county, eight of which are on the island of Krk, while others have mobile recycling yards. The adopted waste management plans show that most local administrations, with the exception of those in the island of Krk, plan to build new recycling yards. The reduction of waste risk has already been initiated by the ongoing remediation of most landfills. Communal Waste Management Centre

“Marinščina” is the county central part of the integrated waste management system, including a mechanical-biological treatment plant (MBO) for unsorted waste and a transfer station. At the annual level (2018), the MBO plant operated at approximately 79 % of capacity, and only on six summer Mondays was 97-100 % of daily capacity received (on other days, about 70 % of the projected quantities were received). The largest daily quantities of mixed municipal waste of about 400 tons were recorded in a few peak days in August and September, when the full nominal capacity of the plant was reached. The current waste management is characterized in a way that cannot be called a complete waste management system, since not being unified with significant differences in the quality and manner of waste disposal between individual local administrations. Therefore, with the final stages of establishing an integrated waste management system through CWMC Marinščina, it is expected these issues will be reduced.

## 5 Conclusions

Since the Circular Economy Package has been launched by the European Commission, it was transformed as one of the key political priorities of the EU, not only until 2020, but is also essential political priority in this decade, being an essential part of the EU Green Deal, which shapes the EU investments, at least until 2029. The shift towards the circular as well as the green economy as a political priority was obvious since the Commission estimated the large investment and employment potential, as well as huge necessity for the sustainable environment protection that cannot be neglected. The Republic of Croatia, as shown, faces both legislative and implementation unconformities considering waste disposal, use and the resource reuse, but still, that can be a great incentive for implementing waste managing in order to establish the circular economy. The benefits for the implementation of the circular economy in terms of green technologies are unavoidable, while the sector in Primorje- Gorski Kotar County marks remarkable results, not only by implemented projects, but also the propulsive entrepreneurship that has to be supported not only by the EU funds, but also by the broad coalition of public institution, entrepreneurship, local and regional administration, civil sector as well as citizens in order to reach the full transformation, not only of the economic model, but also the way of everyday living.

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