ENERGY-CLIMATE TRANSITION IN TOURISM DESTINATIONS IN CROATIA

Marinela Krstinić Nižić
Zvonimira Šverko Grdić
Antonio Dekanić

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Abstract
Purpose – Developed urban destinations face problems such as uneven distribution of infrastructure, environmental degradation and pollution, increased energy demands, uneven distribution of water and food, lack of basic sanitation, etc. Scientists and experts are recognizing increasing problems and pressures related to urban tourism infrastructure (transportation, housing, water, electricity, and urban services), so destinations are increasingly opting for complete redesign, which involves high investment costs. In addition, due to greenhouse gas emissions, cities need to develop sustainable strategies for production and distribution, transportation, water management, urban planning, and the development of environmentally friendly hotels and other accommodation facilities. Therefore, Sustainable Energy and Climate Action Plans (SECAP) need to be developed to analyze the current situation and prepare actions for the best possible energy and climate transition in tourism.
Methodology – By systematically linking current theoretical and scientific knowledge in the field of efficient energy use in tourism destinations, the paper provides an analysis of the Sustainable Energy and Climate Action Plans (SECAP) of tourism destinations in Primorsko-Goranska and Istrian County. SECAP is a strategic document for climate change adaptation at the local level. The content analysis method was used for the analysis of SECAP. The research question is whether tourism destinations in Primorsko-Goranska and Istrian County have developed SECAPs and whether they are ready to take actions to implement them. The identified threats or crisis climate events in the area of destinations are: sea level rise, heat waves, floods and prolonged rainy periods, and these impacts were analyzed according to the expected risk level.
Findings – The results show that most destinations studied do not have a SECAP, and the paper provides guidance and suggestions for its implementation. For destinations to develop an integrated approach to promote quality of life and work, it is necessary to put into practice the guidelines of sustainable development with emphasis on climate change adaptation and energy efficiency improvement.
Contribution - The SECAPs were developed through a participatory process involving all relevant local stakeholders to maximize understanding and acceptance of these plans. The authors propose measures that, according to the experience of other countries, can bring savings that do not require large financial resources, but presuppose a constant commitment through educational activities and the organization of workshops to raise awareness among all stakeholders. The contribution of the paper is to propose measures that help managers, decision makers, the population and other stakeholders of the destination to facilitate and accelerate the energy transition and reduce negative impacts on the environment.
Keywords energy climate change, sustainable development, SECAP, tourism destinations

INTRODUCTION

The world is becoming more urban, and as of 2007, more than 50% of the world's population lives in cities. According to UN, this number is expected to increase to 60% by 2030 (Perea-Moreno and Hernandez-Escobedo 2021). In many developed and underdeveloped regions of the world, such as Latin America and Europe, this number has already exceeded 75% (Philippi Cortese et al. 2022). In addition to population growth and urbanization, cities face problems such as urban sprawl, uneven distribution of infrastructure, environmental degradation and pollution, increased energy demand, uneven distribution of water and food, lack of sanitation, etc. (Johnson et al. 2011, Philippi Cortese et al. 2022). Falconer and Mitchell (2012) recognize the increasingly common problems and stresses associated with urban infrastructure (transportation, housing, water, electricity, and urban services), especially in cities developing tourism, so such tourist destinations are increasingly opting for complete redevelopment. withdraws capital expenditures. Due to greenhouse gas emissions, destinations also need to develop sustainable strategies for production and distribution, transportation, water management, urban planning, and green building development. As cities have limited budgetary resources, it is becoming increasingly difficult to address the aforementioned issues, making the development of modern destinations the only solution.

The UN has developed 17 ambitious proposals to combat the major problems of the world (poverty, climate change, inequality, environmental protection, etc.). The goal is to make cities and settlements inclusive, safe, resilient and sustainable (Pellegrino 2021). In this context, a sustainable destination is a place where the use of material and energy resources and the disposal of waste do not exceed the capacity of the environment (Marcuta et al. 2021). To achieve sustainability, tourism destinations face the following challenges: Reducing CO_2 emissions, using energy efficiency and renewable energy sources, creating and maintaining green spaces in cities, and promoting urban mobility and public transport by citizens (Perea-Moreno and Hernandez-Escobedo 2021). A destination that wants to achieve an energy-climate transition needs a comprehensive approach to management and development that balances the technological, economic, and social factors of the urban ecosystem (Monzon 2015; Magni et al. 2020). By combining the development of ICT-driven smart cities and sustainable energy, the concept of energy transition is approaching a digitally mediated version of low-carbon cities (O'Neill 2018; Onyanta 2016). Energy, sustainability, and smart cities are related concepts that require an integrated approach to promote quality of life and sustainability (Krstinić Nižić and Blažević 2017). In order for humanity to continue to develop and progress in the next generations, sustainable urban development with increased energy efficiency is required (Krstinić Nižić et al. 2017; Philippi Cortese et al. 2022). A major constraint to the economic development of tourism destinations is the cost of electricity, as energy demand increases with the increase in the number of overnight stays by tourists, as well as the population and its living conditions. Access to energy is affected by financial factors, and the supply of affordable electricity is a prerequisite for the socioeconomic development of cities. The solution to the inevitable increase in electricity demand cannot lie only in increasing energy production from traditional fossil fuels. Sustainable Development Goal 7 of UN, which provides for affordable and clean energy supply, addresses access to various energy sources, especially renewable,

efficient, and environmentally friendly ones. In addition, electricity must be sustainable (Philippi Cortese et al. 2022).

The Republic of Croatia has long been exposed to the negative effects of climate change, which, among other things, lead to significant economic losses. According to the report of the European Environment Agency (EEA), the Republic of Croatia belongs to the group of three European countries with the highest cumulative share of damage caused by extreme weather and climate events in relation to the gross national product. According to calculations, in the period from 1980 to 2013, i.e. over 33 years, these damages amounted to about 2 billion and 250 million euros, which corresponds to an average of about 68 million euros per year. The total amount of reported losses for the period from 2013 to 2018, i.e., over 6 years, was about 1.8 billion euros, equivalent to about 295 million euros per year. In 2014 and 2015, exceptional losses increased significantly (2 billion and 830 million euros, respectively). Certain sectors of the economy were severely affected during this period. According to some estimates, extreme weather conditions caused 173 million euros in damages in the agricultural sector between 2000 and 2007, while the 2003 drought caused between 63 and 96 million euros in damages in the energy sector. It is also estimated that in August 2003, the number of deaths from heat stroke was 4% higher. Other losses of human life, cultural heritage, and ecosystem services are not included in this analysis, and an appropriate methodology for a full assessment of climate change impacts is still being developed. The degree of Croatia's vulnerability can be estimated from the fact that agriculture and tourism account for a quarter of total GDP in 2018 (prilagodba-klimi.hr 2021).

The aim of the paper is to analyze the Sustainable Energy and Climate Action Plans (SECAP) of tourist destinations in Primorsko - goranska and Istria counties. SECAP is a strategic document for climate change adaptation at the local level. Local self-governing units as destinations are not required to prepare a SECAP, so the additional goal of the work is to raise awareness among destination stakeholders about the importance of taking action to reduce the risk of climate change. General scientific methods were used as tools in the selection and design of information for the needs of this work: the method of table research, the method of analysis and synthesis, the method of compilation, the method of induction and deduction and the method of description. In selecting the sample for further analysis, one major urban tourist center in Primorsko - goranska County (Rijeka) and one in Istria County (Pula) were considered, as well as a joint SECAP tourist destination in Primorsko – goranska County (Opatija, Kastav, Matulji, Čavle) and Istria County (Buje, Novigrad, Brtonigla). The studied areas are characterized by high population density, which, combined with the increase in the number of tourists during the tourist season, can represent a major risk factor for all sectors (health, water supply, energy, waste management, etc.).

After the introductory chapter, the Sustainable Energy and Climate Action Plans (SECAPs) in the cities of the Republic of Croatia are presented, and the available SECAPs for Rijeka and Pula, as important tourist centers, as well as joint SECAPs of smaller tourist destinations are analyzed. The last chapter includes a discussion and conclusion, presenting the main findings that are important for all stakeholders, with the aim of a simpler and faster energy-climate transition.

1. ENERGY AND CLIMATE TRANSITION IN A TOURIST DESTINATION - SUSTAINABLE ENERGY AND CLIMATE ACTION PLAN (SECAP)

The increasing accumulation of greenhouse gases in the atmosphere caused by fossil fuel use due to human activities plays a key role in climate change and pollution that threatens human health. Among global movements for climate and energy action, the Covenant of Mayors is the world's largest agreement for a local sustainable vision. Launched in Europe, this agreement aims not only to bring together local governments that voluntarily commit to meeting and exceeding EU climate and energy targets, but also to support the transition to sustainable, low-carbon, and climate-resilient development in eight southern Mediterranean countries through the CES-MED (Cleaner Energy Saving Mediterranean Cities) programme (Saad et al. 2019). Since 2008, many municipalities in the EU have participated in the Covenant of Mayors initiative and developed a Sustainable Energy Action Plan (SEAP) to help mitigate climate change (Jekabsone et al. 2021). The Covenant of Mayors initiated and embodied the formal voluntary engagement of all councils, cities, and regions. Brownlee et al. (2022) point out that the joint climate planning developed under the European Covenant of Mayors initiative is effective in creating synergies among local authorities and in defining and implementing adaptation strategies and actions at the territorial level.

Of the total eight types of local climate plans identified by Reckien et al. (2018), three types of autonomous local climate plans are classified as type A1 (plans developed autonomously), A2 (plans developed according to national requirements), or A3 (plans developed for the international climate network). There are large differences between countries in terms of the prevalence of local climate plans, with generally more plans developed by cities in Central and Northern Europe. About 66% of EU cities have an A1, A2, or A3 mitigation plan, 26% have an adaptation plan, and 17% have a joint adaptation and mitigation plan, while about 33% have no form of independent local climate plan (i.e., plans classified as A1, A2, or A3). Mitigation plans outpace adaptation plans, but mitigation planning does not always precede adaptation planning. Reckien et al. (2018) found that city size, national legislation, and international networks can influence the development of local climate plans. The authors conclude that city size is an important factor, as about 80% of cities with more than 500,000 inhabitants have a comprehensive and independent climate change mitigation and/or adaptation plan (A1). In the four countries with national climate legislation (A2), i.e., Denmark, France, Slovakia, and the United Kingdom, cities are nearly twice as likely to have local climate change mitigation plans and five times as likely to have local adaptation plans than cities in countries without such legislation. A1 and A2 mitigation plans are particularly numerous in Denmark, Poland, Germany, and Finland, while A1 and A2 adaptation plans predominate in Denmark, Finland, the United Kingdom, and France. Integration of adaptation and mitigation plans has been done in two countries where local climate plans are mandatory, France and the UK. Finally, local climate plans developed for international climate networks (A3) are found in many countries where autonomous plans (type A1) are less common. This is the most comprehensive analysis of local climate planning to date. The results are of international significance as they will inform and support decision-making on climate planning and policy development at national, EU, and global levels based on the most comprehensive and up-to-date knowledge of local climate planning to date (Reckien et al. 2018).

The Covenant of Mayors plays an important role in encouraging smaller cities and tourism destinations, especially in Italy and Spain but also in many other countries, to engage in climate action (Reckien et al. 2018). To respond to the new 2030 policy targets, the Council of Ministers has broadened its focus to require local goverments to cover climate adaptation activities starting in 2018. As a result, many countries have evolved the existing system of Sustainable Energy Action Plans (SEAPs) into Sustainable Energy and Climate Action Plans (SECAPs). SECAPs are developed through a participatory process involving all relevant local stakeholders to maximise understanding and acceptance (Jekabsone et al. 2021). The goal is to reduce CO_2 emissions by 40% by 2030 with the help of action plans for sustainable energy and climate development (Thellufsen 2020). Activities in this context will improve energy efficiency, curb energy consumption, and influence adaptation to climate change (Saad et al. 2021; Scorza and Santopietro 2021).

SECAP therefore emerged from the need for a new tool that would fill the gaps and lead to a more developed, generalised approach adapted to the regional context. Indeed, the tools proposed by CES-MED, used in the Southern Mediterranean countries and created in the framework of the Mayors' Agreement on the Containment and Reduction of Greenhouse Gas Emissions Towards a Sustainable Future, have not always been sufficient. There seems to be no value of the emission factor in the carbon footprint given for each country. Moreover, without the technical support of CES-MED, the classic tools did not allow any entity to identify and determine the performance of each measure, clearly listed according to the priority of energy efficiency and associated investment costs, to develop a sustainable energy action plan and climate.

In 2018, the European Commission issued a guidance document, "How to develop a Sustainable Energy and Climate Action Plan (SECAP)," indicating that the transition to a more sustainable urban environment must begin at the local level with a shared understanding that there is significant potential for reducing CO_2 emissions at the level of tourism destinations (European Commission 2017). The above understanding provides a basis for political leadership to promote a research process and opportunities to discuss different options with a wide range of stakeholders for selecting, implementing, and monitoring local actions. In this process, local authorities are able to support and mobilize action for local investment and energy generation by using different options for urban energy and climate management: 1. municipal self-governance, 2. municipal education (management by empowerment), 3. management by provision, 4. regulation and planning (management by authorities). In general, the barriers that can be addressed by each major tool within these management modes are different. For this reason, it is often necessary to combine multiple management modes to strengthen and align incentives for specific objectives (Bertoldi 2018; European Commission 2017). Therefore, the following is an analysis of the SECAP for the territory of the Republic of Croatia.

2. ANALYSIS OF ENERGY AND CLIMATE SUSTAINABLE DEVELOPMENT ACTION PLANS (SECAP) IN THE COUNTIES OF PRIMORSKO-GORANSKA AND ISTRIA

Out of a total of 128 cities, only 28 cities (22%) and out of a total of 429 municipalities, only 9 municipalities (2%) have established SECAPs (door.hr 2022). The data suggest that SECAP has not been adequately implemented. Therefore, the question arises as to which cities in Primorsko - goranska and Istria counties have developed the aforementioned plan and whether tourism destinations in these two counties under study are prepared for the energy-climate transition. It can be seen that Adriatic Croatia leads in the number of prepared SECAPs compared to the continental part of Croatia. Most of the cities or tourist destinations in the Adriatic part of the Republic of Croatia have a SECAP. These are mainly the tourist destinations on the northern Adriatic Sea. When selecting the sample for further analysis, one major urban tourist center in Primorsko – goranska Conty (Rijeka) and one in Istria County (Pula) were considered, as well as a joint SECAP tourist destination in Primorsko – goranska County (Opatija, Kastav, Matulji, Čavle), Viškovo) and in IŽ (Buje, Novigrad, Brtonigla). The studied areas are characterized by high population density, which, combined with the increase in the number of tourists during the tourist season, may represent a major risk factor for all sectors (health, water supply, energy, waste management, etc.).

The above-mentioned prepared plans serve as an effective tool for planning mitigation and adaptation measures to climate change, which includes an analysis of the vulnerability of the sector and the measures to be planned. High quality SECAPs ensure that destinations are better prepared to fund actions, ensuring timely implementation and greater resilience of the local community to the highest risk threats of climate change (door.hr 2022).

2.1. Analysis of SECAP in the Primorsko – goranska County

Primorsko- goranska County is interested in ensuring sustainable development and successful implementation of energy and climate change. Tourism is of great importance in this county, which is why it is necessary to think and work intensively on the implementation of energy transition. For this reason, the Primorko – goranska Conuty has joined the project "JOINT SECAP", which is implemented within the framework of the INTERREG program for cross-border cooperation Italy-Croatia 2014-2020. In addition, part of the cities and municipalities in the Primorsko – goranska County have started the preparation of SECAP, and the following text presents the most important documents that will ensure the transition in the leading cities and municipalities of the County.

2.1.1. Sustainable Energy Development and Climate Change Adaptation Action Plan (SECAP) for the City of Rijeka

The City of Rijeka directs its energy and climate policy towards sustainable development of the urban area, based on the principles of environmental protection, energy efficiency,

use of renewable energy sources and sustainable construction. This was done precisely because of the negative consequences of climate change expected in the future. Identified threats, i.e. unfavorable climatic events expected in the area of the City of Rijeka are: Sea level rise, occurrence of heat waves, floods and longer rainy periods. According to the analyzed data in the five observed sectors in the SECAP of the City of Rijeka, there is a high risk in the area of water supply, in the summer months due to drought and in the winter months due to possible flooding or water pollution caused by prolonged periods of rain.

The commitment to achieving the goals of sustainable development is evidenced by the fact that the City of Rijeka is one of the first European cities to join the Mayors' Agreement. Due to the expected threats, it is necessary to take various measures for mitigation and adaptation to climate change, which are presented in Table 1.

Table 1: **Presentation of climate change mitigation and adaptation measures by sector for the city of Rijeka**

Measures for mitigation of climate changes	Measures for adaptation to climate changes
CONSTRUCTION - Implementation of systematic energy management according to ISO50001:2018 in buildings of the city of Rijeka, education and promotion of energy efficiency for citizens, - Energy certification, integrated energy renovation of public buildings, construction of a biomass boiler house, installation of 10 photovoltaic systems up to 30 kW on the roofs of public buildings, installation of solar thermal systems for water heating in public buildings, - Renewal of the heating system of the City of Rijeka - II. Phase, Energy rehabilitation of multi-family buildings, Energy rehabilitation of single-family buildings, Installation of 100 photovoltaic systems with a capacity of 15 kW on the roofs of single-family buildings, Mapping of heat demand and potential for the use of renewable energy sources in the city of Rijeka, - Energy renovation of buildings in the commercial sector, installation of 30 photovoltaic systems with a capacity of 30 kW on buildings in the commercial sector. **TRANSPORT** - Promotional, informational and educational activities and activities aimed at improving the quality of transport and reducing CO_2 emissions,	**COASTAL AREA** - Plan for the integral management of the Primorsko- goranska county coastal area, - Strengthening the resilience of coastal water supply infrastructure and coastal water resources. **WATER SUPPLY** - Preparation of design and planning documents for construction, reconstruction and expansion of water infrastructure and protection from the harmful effects of water, - Development of green and blue infrastructure, - Mapping of water sources outside the public water supply system, - Strengthening the capacity of competent institutions to act in case of extreme hydrological conditions, - Analyze the possibility of developing a project to increase the use of rainwater and/or build a device for desalination of salt water. **HEALTH** - Network and improve the monitoring system for environmental indicators related to climate change, - Increase the number of safe points in case of extreme weather conditions, - Increase awareness among the public and key stakeholders in the health professions and long-term priority professions.

- Mapping of the potential of electric mobility in road transport in the city of Rijeka; co-financing of the construction of charging stations for electric vehicles, co-financing of the purchase of zero-emission and low-emission vehicles for legal entities and citizens), - Procurement of new energy-efficient vehicles by municipal and commercial companies owned or co-owned by the City of Rijeka, - Computerization of public bus transport on the territory of the City of Rijeka, establishment of an infrastructure system for alternative fuels, - Modernization of the new terminals of the system for electric bicycles - e-bikes. **PUBLIC LIGHTING** - Modernization of the public lighting system.	**TOURISM** - Incorporate climate change adaptation measures into the tourism development strategy, - Educate high school and college students about climate change. **ENERGY FACTOR** - Strengthen the resilience of the distribution network. **HORIZONTAL MEASURES** - Strengthen the technical and institutional capacity of experts involved in the spatial planning and planning system, - Integrate adaptation measures into the spatial planning and zoning system, - Strengthening awareness and sensitization of the public and decision makers at all levels.

Source: Author's elaboration according to the Sustainable Energy and Climate Action Plan (SECAP) for the City of Rijeka 2020.

The City of Rijeka intends to reduce CO_2 emissions by 47.32% by 2030, compared to the reference year 2008, through the above-mentioned mitigation and adaptation measures. Adaptation measures serve to adapt the city to the new climatic conditions that are certain to occur.

2.1.2. Joint Action Plan for Sustainable Energy and Climate Development (JOINT SECAP) - City of Kastav, City of Opatija, Municipality of Čavle, Municipality of Matulji and Municipality of Viškovo

The project "JOINT SECAP Joint Strategies for Climate Change Adaptation in Coastal Areas" (Joint SECAP - Joint Strategies for Climate Change Adaptation in Coastal Areas) is implemented in the framework of the INTERREG V-A Cross-border Cooperation Program Italy - Croatia (2014-2020) and has the following basic objectives:

- Raising public awareness of climate change risks and actions through professional workshops, seminars, websites and promotional materials,
- Data collection and risk assessment of climate change,
- Creation of an internet platform where case studies and climate and energy actions with data on climate change risks will be available to all interested stakeholders,
- Creation of a joint action plan (SECAP) for a specific area (Joint Action Plan for Sustainable Energy and Climate Development (JOINT SECAP) City of Kastav, City of Opatija, Municipalities of Čavle, Matulji and Viškovo).

In the area of Kastvo, Opatija, the Municipality of Čavle, the Municipality of Matulji and the Municipality of Viškovo, various unfavorable consequences of climate change are expected in the future in terms of problems with water supply, health and the occurrence

of unfavorable consequences in the tourism sector. For all observed sectors, the estimated risks are moderate, which indicates a good geographical location, but also the development of the area. The area is characterized by a high population density, which, combined with the increase in the number of tourists during the tourist season, is an important risk factor in all sectors.
In order to adapt to the new climate conditions, it is necessary to implement a series of mitigation and adaptation measures in different sectors, which are presented in Table 2.

Table 2: **Presentation of mitigation and adaptation measures to climate change by sector for the territory of the City of Kastav, the City of Opatija and the municipalities of Čavle, Matulji and Viškovo**

Measures for mitigation of climate changes	Measurres for adaptation to climate changes
CONSTRUCTION - Information and education on increasing energy efficiency in buildings owned by local self-government units, - Energy renovation of buildings owned by local self-government units, - Application of new technologies that use renewable energy sources, - Information and education on increasing energy efficiency and the ability to use RES in the commercial and service sectors, - Energy renovation of buildings in the commercial and service sectors, - Information and education on increasing energy efficiency and the ability to use RES in the residential sector, - Energy renovation of single-family houses, - Energy renovation of buildings with multiple apartments. **TRANSPORTATION** - Promotion of integrated and intelligent transport and development of	**WATER MANAGEMENT AND ENVIRONMENT** - Economic evaluation of groundwater and valorization of springs in the monitoring area, - Identification of vulnerable populations and critical assets in terms of flood risk, - Reconstruction of the water supply network and installation of equipment for intelligent monitoring of the water supply system to reduce water losses in the system, - Raise public awareness of the importance of household water use and the impact of climate change on water as a component of the environment, - Reducing water use in the maintenance of public green spaces, nurseries, and sports and recreation areas, - Rationalization of water use in public buildings, - Analyzing the impact of sea level rise in the part of the observation area that is located by the sea, - Strengthening the resilience of water and municipal infrastructure in the coastal areas of SECAP, - Analyzing opportunities for recycling wastewater for reuse and collecting rainwater. **HEALTH SECTOR AND CIVIL PROTECTION** - Implement protocol on treatment and recommendations for heat protection, - Prepare an analysis on the increase in incidence of diseases due to climate change impacts, - Develop health infrastructure related to the impact of weather extremes and the seasonal nature of tourism, - Development of facilities and programs for the elderly, frail, and home care in the observed area, - Planning and building safe places in case of extreme weather conditions, - Ensuring the availability of canopies to protect people from the sun at public transportation stops, - Installing automatic defibrillators in public buildings and cardiopulmonary resuscitation classes for employees.

alternative fuel infrastructure, - Development of transport infrastructure in local self-government units, - Replacement of existing service vehicles of local self-government units with alternative fuel vehicles. **PUBLIC LIGHTING** - Reconstruction of public lighting in the area under consideration.	**ECONOMY AND TOURISM** - Promote entrepreneurship and establish incubators in climate change, energy efficiency, green production, sustainable development, and green technologies, - Increasing resilience to climate change in the tourism sector (public measurement and display of UV radiation and temperature, availability of drinking water in public places and in existing catering establishments, personal protection against UV radiation), - Development and promotion of tourism activities compatible with resilience to extreme weather conditions (diversification of the offer in the locations of the observed area Učka, Platak, etc.), - Raising awareness of tourism workers about the impacts, risks and opportunities of adaptation to climate change, - Strengthening the resilience of tourism infrastructure to various weather extremes, - Promoting climate change education among students of tourism professions.

Source: prepared by the author according to the Joint Action Plan for Sustainable Development in the Field of Energy and Climate (JOINT SECAP) for the City of Kastav, the City of Opatija, the Municipality of Čavle, the Municipality of Matulji and the Municipality of Viškovo 2021.

In the joint SECAP prepared for the territory of the City of Kastav, the City of Opatija, the Municipality of Čavle, the Municipality of Matulji and the Municipality of Viškovo, the focus of the measures to be implemented to reduce CO_2 emissions is mainly on the transport and construction sectors, where the greatest savings will be achieved. To this end, measures are being introduced in the area under consideration that are aimed at changing the behavior of citizens both in transport and in their households and workplaces. These are measures that, according to the experience of other countries, can bring savings, for which it is not necessary to invest a lot of money, but which require a constant commitment through awareness activities, organization of workshops, preparation and distribution of leaflets and brochures. In parallel with the so-called "soft" measures, the considered area will develop and promote the reduction of energy consumption in buildings, which includes tourist facilities, but primarily through energy renovations of buildings owned by local self-government units and private, service and commercial facilities. In the transportation sector, advancing technology and increasing the share of electric and hybrid vehicles will certainly play an important role. Tourist destinations should be ready to provide electric charging stations for their tourists. The transport infrastructure of local self-government units is relatively well developed, with many pedestrian and bicycle routes, but it has not yet had a sufficient impact on changing the behavior of citizens, who still use cars to a large extent. However, the outdoor amenities with a developed network of bike lanes can also serve the local population. The public lighting segment contributes only slightly to the planned overall reduction of CO_2 emissions, but the financial savings are significant, and therefore the area under consideration will continue to seek solutions for the development of this segment through further modernization, replacing lighting fixtures and regulating the luminous flux.

2.2. Analysis of SECAP in the County of Istria

Istria County is an area of the Republic of Croatia where tourism is developed and which is leading in the implementation of measures to ensure sustainable development. For this reason, the County of Istria has joined the Italian-Croatian Interreg project under the name Joint_Secap, the final result of which is the preparation of SECAPs for the municipalities and towns of this county. The SECAP plans of the City of Pula, the City of Buja, the City of Novigrad and the Municipality of Brtonigla are analyzed below.

2.2.1. Climate change adaptation strategy with plan City of Pula - Pola

The city of Pula has two documents that deal with the transition to energy and climate. The first document is the Action Plan for Sustainable Energy Development, while the second document is the Strategy with Climate Change Adaptation Plan, which will be analyzed here. The purpose of the document is to identify the activities and measures that the City of Pula can implement to improve adaptation to the upcoming energy and climate changes. The City of Pula has selected 19 measures for mitigation and implementation in the first period of adaptation to climate change in the period from 2020 to 2024. Likewise, 24 climate change adaptation measures have been proposed, which are presented in Table 3.

Table 3: **Presentation of mitigation and adaptation measures to climate change by sector for the city of Pula**

Measures for mitigation of climate changes	Measurres for adaptation to climate changes
SUPER SECTOR - Strengthen research and management capacity to assess the occurrence and risk of adverse climate change impacts, - Strengthen awareness and sensitization of the public and decision makers at all levels. **TOURISM** - Establish guidelines for the implementation of adaptation measures to achieve, among other things, sustainable development of tourism, - Implementation of adaptation guidelines. **ENVIRONMENT PROTECTION AND BIODIVERSITY** - Improve sustainable management in urban ecosystems, - Preparation and implementation of plans for sustainable infrastructure in urban ecosystems, - Organization of technical lectures, - Organization of technical lectures and workshops. **TRAFFIC**	**BUILDING** - Training of employees and users of City-owned buildings, - Energy Day celebrations and other promotional activities, - Replacement of existing light bulbs with energy efficient light bulbs, - Implementation of green public procurement for the purchase of electrical appliances in city-owned buildings, - Thermal insulation of external walls (facade and joinery) of municipal buildings, - Installation of photovoltaic panels on the roofs of municipal buildings, - Installation of solar collectors for the treatment of hot water consumption, - Promotion of the use of renewable energy sources in households, - Encouraging citizens to insulate the outer shell (facade and roof) of residential buildings, - Installation of energy-saving light bulbs in all households,

- Creation and implementation of sustainable infrastructure plans in urban ecosystems. **WATER MANAGEMENT** - Preparation of revisions of existing projects for protection against harmful effects of water, - Construction and reconstruction of multipurpose facilities for protection against harmful effects of water, - Mapping of water sources outside the public water supply system, - Rationalization of water use in case of increased demand due to unfavorable climatic and hydrological conditions and reduction of water supply losses, - Retention of rainwater, - Implementation of the concept of green infrastructure. **HEALTH** - Planning and implementation of planting with non-allergenic species, - Planning of public awareness activities, - Networking and improvement of the system for monitoring indicators of the environment related to climate change, - Establishing indicators of the impact of meteorological/climatological parameters on health using environmental media.	- Replacement of household appliances with energy efficient appliances of energy efficiency class A +++, - Installation of thermostatic valves for radiators in households, - Construction of small photovoltaic systems, - Promotion of the use of renewable energy sources in the commercial and service sectors, - Installation of energy-saving light bulbs in the commercial and service sector, - Promotion of the commercial and service sector for thermal insulation of facades and roofs of non-residential buildings. **TRANSPORT** - Promotional, informational and educational measures and activities, - Use of electric vehicles for public purposes, - Construction of an electric charging station in the city and promotion of electric mobility, - Improving bicycle transportation, - Increased use of biofuel, - Replacement of old vehicles with new ones according to the EURO standard for new vehicles, - Project to modernise and expand the public transport system. **PUBLIC LIGHTING** - Modernization of the public lighting system.

Source: prepared by the author according to the Strategy with the Plan for Adaptation to Climate Change City of Pula - Pola, LIFE 2014 – 2020; Action Plan for Energy Sustainable Development SEAP - Revision, City of Pula 2019.

In order to achieve the energy and climate transition in the city of Pula, the development of the "Smart City" concept is proposed. Together with the proposed climate change adaptation and mitigation measures, a significant reduction of greenhouse gas emissions and adaptation to new living and economic conditions in the territory of the City of Pula will be achieved.

As can be seen from the proposed measures, the energy sector is extremely vulnerable, especially during the summer season, due to the need to cool tourist facilities, households and production processes. In the tourism sector, a high risk from climate change manifests itself in a decrease in the number of tourist arrivals and overnight stays, and a low risk in an increase in costs due to climate change. In the waste management sector, high temperatures also lead to accelerated decomposition of waste, accompanied by an unpleasant odour, and action is needed (Caponi 2022). As for the environment and biodiversity, natural water bodies dry up during dry periods and high temperatures, and extreme weather conditions also pose health risks to sensitive groups of people. All this points to the need to implement SECAP measures.

2.2.2. Joint Action Plan for Sustainable Energy and Climate Protection - Joint SECAP - City of Buje, City of Novigrad and Municipality of Brtonigla

This Joint SECAP was prepared within the framework of cross-border cooperation (Italy and Croatia) in order to create action plans that include certain joint measures for the implementation of energy and climate sustainability for the future period, which will apply to a larger geographical area.

The joint action plan recommends the coordination and implementation of specific actions during their implementation. In this way, the goals of each city/municipality facing similar/same challenges in the considered area should be achieved more quickly, which is why universal measures for implementation were adopted. Recommendations for joint implementation of measures are mainly related to the building sector (in the area of incentives) and transport (electric charging stations, improvement of cycling). Table 4 shows the proposals for mitigation and adaptation measures for the area of the city of Buja, the city of Novigrad and the municipality of Brtonigla.

Table 4: **Joint measures for adaptation to climate change for the territory of the City of Buje, the City of Novigrad and the Municipality of Brtonigla**

Measures for mitigation of climate changes	Measurres for adaptation to climate changes
CONSTRUCTION - Training of staff and users of public sector buildings, - Energy Day celebrations and other promotional activities, - Replacement of existing light bulbs with energy efficient light bulbs in public sector buildings, - Introduction of green public procurement criteria for public buildings, - Energy renovation of public buildings, - Installation of photovoltaic panels on the roofs of public buildings, - Installation of solar panels for water heating in public buildings, - Promotion and use of renewable energy sources for heating/cooling and water heating in households, - Promotion and implementation of energy renovation of residential buildings, - Encouraging and installing energy-saving light bulbs in all households, - Increasing the energy efficiency of household appliances, - Encouraging and installing energy-saving light bulbs in all households, - Promotion and adjustment of thermostatic valves on radiators in households,	AGRICULTURE - Training of farmers in financial support for project development and entrepreneurial knowledge, - Construction of mini and micro reservoirs for irrigation, - Continuation of co-financing of training for crop, livestock and plant insurance premiums. **HEALTH** - Implement protocol on heat protection measures and recommendations, - Establish a new or remodel an existing health care facility to improve health care delivery, - Install green and smart canopies at public transit stops and public parking lots, - Integrating green infrastructure into land use plans. **WATER SUPPLY AND DRAINAGE** - Reconstruction of the water supply network, - Implementation of educational programs on efficient water consumption, - Saving water consumption in JLS buildings, - Introduction of environmentally friendly showers at public beaches,

- Installation of small photovoltaic systems in households, - Replacement of household appliances with more energy efficient appliances, - Installation of small photovoltaic systems in the household sector, - Promotion and use of renewable energy sources in the commercial sector, - Promotion and installation of energy saving lamps in the commercial and service sectors, - Energy renovation of facades in the service sector. **TRANSPORT** - Promotional, informational and educational measures and activities, - Use of electric and hybrid vehicles for public purposes, - Construction of an electric charging station and promotion of electric mobility, - Improvement of bicycle transportation, - Rejecting the use of biofuels, - Promoting the replacement of old vehicles in accordance with the Euro standard for new vehicles, - Creation of a plan for sustainable urban mobility, - Development of the plan for sustainable electric mobility. **PUBLIC LIGHTING** - Modernization of the public lighting system.	- Construction of a complete public sewage system, including treatment for water reuse. **TOURISM** - Incorporate climate change issues into strategic planning documents for tourism development, - Promote the development of sports and recreational tourism, - Promoting the development of cultural tourism, - Promote the development of agrotourism, - Educating people working in tourism about climate change, - Creation of a unique marketing plan for the development of tourism in the NW Istria cluster. **COASTAL AREA** - Assess the vulnerability and risk of the coastal area to climate change, - Continuous updating of the hydrographic database, - Reconstruction of existing breakwaters and/or construction of new breakwaters. **RAINE PLANNING** - Training of decision makers in integrative spatial planning.

Source: prepared by the author according to the Joint Action Plan for Sustainable Energy and Climate (Joint SECAP) City of Buje - Buie, City of Novigrad - Cittanova and Municipality of Brtonigla - Verteneglio 2021.

DISCUSSION

Most adaptation measures are implemented in the tourism, water supply, and drainage sectors, and in the above sectors, climate change adaptation measures must be implemented in a timely manner. Most mitigation measures are mandated in the construction sector, and efforts are made to reduce GHG emissions as much as possible. Most of the measures are the same for each LGU, which is to be expected with relatively similar characteristics of the area and similar challenges. Joint coordination of implementation is recommended to achieve each target by 2030. The measures are mainly related to education and promotion, as well as infrastructure solutions. Adaptation measures for the tourism sector (diversification of tourism supply) were particularly highlighted, where joint efforts could lead to multiple benefits for the entire region.

Certain destinations will need to implement certain tourism and capital infrastructure adaptation measures due to the potential negative impacts of climate change. Climate change undoubtedly affects tourism development investment strategies (Perić and

Šverko Grdić 2017, 58), so special attention must be paid to climate change impacts. Highlighting the impact of tourism on the environment (which causes climate change) is an important focus of sustainable tourism. Therefore, the negative impacts of tourism force tourism policy makers to consider the threats of climate change in the context of tourism development and sustainable tourism. For example, author Scott (2011) asserts that addressing climate change is considered a prerequisite for sustainable development and is therefore relevant to advancing research on sustainable tourism. Tourism is currently considered one of the least prepared sectors of the economy to address the risks and opportunities of climate change. Tourism workers and stakeholders have only now begun to develop capacity to improve the knowledge needed to inform businesses, communities, and governments about issues and potential pathways into the future. A retreat by the tourism industry or its researchers from addressing climate change issues would harm the tourism industry for the simple reason that tourism would not prepare for future business conditions.

Therefore, Farid et al. (2016) provide some practical recommendations for tourism policy makers regarding climate change:

- Encourage the development of mobile applications at local, regional, and international levels to inform and guide tourists,
- Promote appropriate and effective collaboration between individuals and agencies involved in local tourism, tourism centers, cultural institutions, and tourism service providers,
- Provide adequate resources for research to identify the current situation and issues and challenges related to improving the quality and accuracy of regional tourism databases in order to make better policy decisions,
- Integrate open processes by involving governments at different levels in the dialog, as well as national and international tourism and environmental organizations, non-governmental organizations and tourists.

In addition to the negative effects, some positive effects are also expected. For example, it is predicted that the future effects of climate change will extend the tourism season in the Republic of Croatia. One of the results of the prediction of the future climate is a greater seasonality of demand, as certain seasons (spring and autumn) will provide more comfort for tourists and visitors (Perić and Šverko Grdić 2017, 71).

CONCLUSION

In Croatia, the majority of tourist arrivals occur in the summer months, when climate changes are expected, making climate an extremely important factor in shaping the tourist offer (Šverko Grdić et al. 2017). In coastal and island destinations, climate change will lead to a loss of attractiveness of the area due to the projected rise in sea level, changes in ocean currents and changes in natural ecosystems, occurrence of extreme air currents, deterioration of the UV index, rise in temperature, disappearance of certain tourist infrastructure, and lack of drinking water. The instability of the Antarctic ice sheets, i.e., the loss of the Greenland ice sheet, potentially leads to a rise in sea level (Racz 2020).

Climate changes are of particular importance for the long-term positioning of tourism destinations in the global market. They will affect destination choices, and some destinations will no longer be able to fully satisfy tourists' needs, while on the other hand, certain destinations will become more attractive. Destinations whose attractiveness is threatened by climate change will have to reposition themselves to maintain their market position (Racz 2020). Climate change is also receiving a great deal of attention in tourism research. The way tourism in the Republic of Croatia responds to climate change is absolutely critical to the sustainability of tourism, and the sector's withdrawal from addressing climate change would be highly detrimental to it. For governments, non-governmental organizations and decision makers, climate change is a new strategic reality that they must face. Destinations with favorable climatic conditions are highly valued and represent an important element in the choice of a destination. Therefore, climate, as one of the main drivers of tourism, will play an even more important role in the choice of a particular destination in the future. Since climate is recognized as one of the most important drivers of tourism, climate change can have a positive or negative impact on tourism, even if tourism itself contributes to climate change. Although the SECAP analysis identifies numerous measures to implement the energy-climate transition, there is still a need to raise awareness about energy consumption and climate change. The energy-climate transition must be enforced today as an important concept to which special attention must be paid in order to solve or at least reduce the accumulated problems in tourist destinations. The preservation and improvement of the environment depends on the investments, their scale and structure, both at the corporate level and at the national and global level, and more and more attention is paid to the environment precisely because there has been an increased awareness of climate change and numerous other problems caused by the human factor, which recently have increasingly threatened the environment and, consequently, the quality of life of people. However, it is necessary to start from individuals who can significantly contribute to finding new solutions. Knowledge is now a key resource, and human resources using information and communication technologies can do much to develop sustainable destinations. With the support of public authorities and detailed actions that take time, the situation can start to change even in destinations that do not yet have a SECAP. Cities can play a key role in developing and implementing climate change programs, as they are at the intersection of local action and climate change adaptation and mitigation commitments at the national and international levels. Promoting sustainable energy in cities can best be achieved through planning, regulation, direct investment, service provision, or awareness raising. The SECAPs analyzed offer concretely elaborated measures and activities, all of which serve the purpose of adapting to the potential negative impacts of climate change in a timely manner and minimizing future damage to tourist destinations. Timely actions can significantly reduce future damage to tourism infrastructure that would significantly affect the attractiveness of destinations.

The potential for renewable energy sources in tourism in the Republic of Croatia is extremely large, especially in construction and transport, but it varies greatly depending on the main characteristics of the destination. Accordingly, renewable energy strategies require tailored approaches for destinations with specific technology options and favorable policy frameworks. In the SECAPs processed, vulnerable sectors were identified in the observed cities, with the aim of taking concrete actions for implementation in the sectors identified as important in the area of these cities. An

important factor for further progress in the implementation of SECAPs is the collaboration and coordination of actions and initiatives at different levels of government. National governments have a key role to play in creating a framework that supports cities in developing their own capacity. Engaging cities in national and global energy agendas can raise the level of ambition and catalyze action at both the local and global levels.

In summary, it is critical that destinations become more energy efficient and that renewable energy sources are used wherever possible and, of course, that modern technologies are deployed. Citizen awareness of the need to reduce energy consumption is also necessary.

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REFERENCES

Action plan for Energy Sustainable Development – SEAP – Revision City of Pula 2019., viewed 15. May 2022, http://www.lifesecadapt.eu/fileadmin/user_upload/ALLEGATI_LIFESECADAPT/EXCHANGE/C3_Adoption_of_Local_Climate_adaptation_strategy_and_plans_through_SEAP_integration/Mitigation_Strategies_and_Action_Plans_-_SECAPs/PULA_Mitigation_Plan-SECAP.pdf

Bertoldi P. (2018), *How to develop a Sustainable Energy and Climate Action Plan (SECAP) – PART 3 – Policies, key actions, good practices for mitigation and adaptation to climate change and Financing SECAP(s)*, Publications Office of the European Union, Luxembourg, ISBN 978-92-79-96927-0, doi: 10.2760/58898

Brownlee, T.D., Camaioni, C., Magaudda, S., Mugnoz, S. and Pellegrino, P. (2022), "The INTERREG Italy-Croatia Joint_SECAP Project: A Collaborative Approach for Adaptation Planning", *Sustainability*, Vol. 14, pp. 404, https://doi.org/10.3390/su14010404

Caponi, V. (2022), "The economic and environmental effects of seasonality of tourism: A look at solid waste", *Ecological Economics,* Vol. 192, No. 3, pp. 1-18.

Door.hr (2022), *Pregled gradova i općina u Hrvatskoj s izrađenim SECAP-ima*, viewed 18 June 2022, https://door.hr/pregleda-gradova-i-opcina-u-hrvatskoj-s-izradenim-secap-ima/.

European Commision (2017), *Best Environmental Management Practive in The Tourism Sector*, viewed 18 June 2022, https://ec.europa.eu/environment/emas/takeagreenstep/pdf/BEMP-6-FINAL.pdf.

Falconer, G. and Mitchell, S. (2012), Smart City Framework; A Systematic Process for Enabling Smart + Connected Communities, Cisco Internet Business Solutions Group.

Farid, H., Hakimian, F., Nair, V., Nair, P. K. and Ismail, N. (2016), "Trend of research on sustainable tourism and climate change in 21st century", *Worldwide Hospitality and Tourism Themes,* Vol. 8, No.5, pp.516–533.

Jekabsone, A., Marín, Delgado, Martin, J.P., Martins, S., Rosa, M. and Kamenders, A. (2021), "Upgrade from SEAP to SECAP: Experience of 6 European Municipalities", *Environmental and Climate Technologies*, Vol. 25, No. 1, pp. 254-264. https://doi.org/10.2478/rtuect-2021-0018

Johnson, B. H., Poulsen, T. G., Hansen, J. A. and Lehmann, M. (2011), "Cities as development drivers: from waste problems to energy recovery and climate change mitigation", *Waste Management & Research,* Vol. 29, No. 10, pp. 1008–1017.

Joint Action Plan for Sustainable Energy and Climate (Joint SECAP) for the City of Kastav, the City of Opatija, the Municipality of Čavle, the Municipality of Matulji and the Municipality of Viškovo (2021), viewed 9 May 2022, Regionalna energetska agencija Kvarner, https://kastav.hr/wp-content/uploads/2021/10/1.-Zajednicki-akcijski-plan-energetski-i-klimatski-odrzivog-razvitka-JOINT-SECAP.pdf.

Joint Action Plan for Sustainable Energy and Climate (Joint SECAP) – for the City of Buje – Buie, City of Novigrad – Cittanova and Municipality Brtonigla – Verteneglio (2021), European Regional Development Fund, viewed 9 May 2022, https://www.brtonigla-verteneglio.hr/hr/strateski-dokumenti/item/4909-zajednicki-akcijski-plan-energetski-odrzivog-razvoja-i-prilagodbe-klimatskim-promjenama-joint-secap.

Krstinić Nižić, M. and Blažević, B. (2017), *Gospodarenje energijom u turizmu*, Fakultet za menadžment u turizmu i ugostiteljstvu, Opatija.

Krstinić Nizić, M., Šverko Grdić, Z. and Endres, R. (2017), "The Advantages and Disadvantages of Renewable Energy in the Tourist Destination", *6 th International Scientific Symposium Economy of Eastern Croatia - Vision and Growth, Osijek,* pp. 634-646.

Magni, M , Musco, F., Litt, G. and Carraretto, G. (2020), "The Mainstreaming of NBS in the SECAP of San Donà di Piave: The LIFE Master Adapt Methodology", *Sustainability*, Vol. 12, No. 23, 10080. https://doi.org/10.3390/su122310080

Marcuta, L., Panait, R. and Marcuta, A. (2021), "The Relationship Between the Circular Economy and Sustainable Waste Management in European Union", *Journal of Business Administration Research*, Vol. 4, No. 1, pp. 37-44.

Monzon, A. (2015), *Smart cities concepts and challenges: Bases for the Assessment of Smart City projects*, Springer International Publishing Switzerland.

O'Neill, K. (2018), "Linking wastes and climate change: Bandwagoning, contention, and global governance", *Wiley Interdisciplinary Reviews: Climate Change, Jogn Wiley & Sons,* Vol. 10, No. 2, pp. 1-17.

Onyanta, A. (2016), "Cities, municipal solid waste management, and climate change: Perspectives from the South", *Geography Compas* Vol. 10, No. 12, pp. 499-513.

Pellegrino, P. (2021), "The transition from SEAP to SECAP: energy and climate-adaptive scenarios in urban planning of the coastal areas", *Archivo di studi urbani e regionali*, 10.3280/ASUR2021-131-S1005

Perea-Moreno, A.-J. and Hernandez-Escobedo, Q. (2021), "The Sustainable City: Advances in Renewable Energy and Energy Saving Systems", *Energies*, Vol. 14, No. 24, 8382, https://doi.org/10.3390/en14248382.

Perić J. and Šverko Grdić Z. (2017), *Klimatske promjene i turizam*, Fakultet za menadžment u turizmu i ugostiteljstvu, Opatija.

Philippi Cortese, T.T., Sousa de Almeida, J.F., Batista, G. Q., Storopoli, J.E., Liu, A. and Yigitcanlar, T. (2022), "Understanding Sustainable Energy in the Context of Smart Cities: A PRISMA Review", *Energies*, Vol. 15, No. 7, 2382, https://doi.org/10.3390/en15072382.

Prilagodba-klimi.hr (2021), *Središnje mjesto za informiranje i edukaciju o prilagodbi klimatskim promjenama u Republici Hrvatskoj*, viewed 30 june 2022, https://prilagodba-klimi.hr/.

Racz, A. (2020), "Međutjecaj klimatskih promjena i turističke djelatnosti – narativni pregled", *Journal of applied health science*, Vol. 6, No. 1, pp. 91-115.

Reckien, D., Salvia, M., Heidrich, O., Church, J. M., Pietrapertosa, F., De Gregorio-Hurtado, S., … Dawson, R. (2018), "How are cities planning to respond to climate change? Assessment of local climate plans from 885 cities in the EU-28", *Journal of Cleaner Production*, Vol. 191, pp. 207–219. https://doi.org/10.1016/j.jclepro.2018.03.220

Saad, S., Lahoud, C., Brouche, M., Hmadi, M., Ghandour, M. and Mourtada, A. (2021), "Advanced tool for elaborating a sustainable energy and climate action plan at municipalities level", *Energy Reports*, Vol. 7, No. 5, pp. 51-69, https://doi.org/10.1016/j.egyr.2021.09.049

Saad, S., Mourtada, A., Brouche, M. and Ghandour, M. (2019), "A developed tool allowing the SouthMediterranean cities to establish their sustainable energy plans", *Materials Science and Engineering*, Vol. 609, 072074. 10.1088/1757-899X/609/7/072074

Scorza, F. and Santopietro, L. (2021), "A systemic perspective for the Sustainable Energy and Climate Action Plan (SECAP) ", *European Planning Studies*, 10.1080/09654313.2021.1954603.

Scott, D. (2011), "Why sustainable tourism must address climate change"*, Journal of Sustainable Tourism,* Vol. 19, No. 1, pp. 17–34.

Strategy with the Plan for Adaptation to Climate Change City of Pula – Pola, LIFE 2014-2020, viewed 9. May 2022., http://www.lifesecadapt.eu/fileadmin/user_upload/ALLEGATI_LIFESECADAPT/EXCHANGE/C3_Adoption_of_Local_Climate_adaptation_strategy_and_plans_through_SEAP_integration/Adaptation_Strategies_and_Action_Plans/PULA_Climate_Change_Adaptation_Plan.pdf

Sustainable enery and Climate Action Plan (SECAP) for the City of Rijeka (2020), DOOR, viewed 9 May 2022, https://www.rijeka.hr/wp-content/uploads/2021/02/Akcijski-plan-odr%C5%BEivog-energetskog-razvoja-i-prilagodbe-na-klimatske-promjene-za-Grad-Rijeku-SECAP.pdf.

Šverko Grdić, Z., Krstinić Nižić, M. and Mamula, M. (2017), "Povezanost klimatskih promjena i turizma: multikriterijska analiza ocjenjivanja mjera prilagodbe", *Ekonomska misao i praksa,* Vol. 1, pp. 171-185.

Thellufsen, J. Z., Lund, H., Sorknæs, P., Østergaard, P. A., Chang, M., Drysdale, D., S. Nielsen, Djørup S.R. and Sperling, K. (2020), "Smart energy cities in a 100% renewable energy context", *Renewable and Sustainable Energy Reviews*, Vol. 129, 109922, https://doi.org/10.1016/j.rser.2020.109922

MARINELA KRSTINIĆ NIŽIĆ, PhD, Full Professor
University of Rijeka, Faculty of Tourism and Hospitality Management
Department of Microeconomics and Macroeconomics
Primorska 42 c, 51410 Opatija, Hrvatska
Phone: ++38551294189
E-mail: marikn@fthm.hr

ZVONIMIRA ŠVERKO GRDIĆ, PhD, Associated Professor
University of Rijeka, Faculty of Tourism and Hospitality Management
Department of Microeconomics and Macroeconomics
Primorska 42 c, 51410 Opatija, Hrvatska
Phone: ++38551294107
E-mail: zgrdic@fthm.hr

ANTONIO DEKANIĆ, PhD student
University of Rijeka, Faculty of Tourism and Hospitality Management
Department of Microeconomics and Macroeconomics
Primorska 42 c, 51410 Opatija, Hrvatska
Phone: ++38551294189
E-mail: antonio.dekanic0@gmail.com