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Review article

FIT FOR 55 – DOES IT FIT ALL? AIR AND RAIL TRANSPORT AFTER COVID – 19 PANDEMIC*

Biljana Činčurak Erceg, PhD, Associate Professor
Josip Juraj Strossmayer University of Osijek, Faculty of Law Osijek
Stjepana Radića 13, Osijek, Croatia
biljana.cincurak@pravos.hr

Aleksandra Vasilj, PhD, Full Professor
Josip Juraj Strossmayer University of Osijek, Faculty of Law Osijek
Stjepana Radića 13, Osijek, Croatia
avasilj@pravos.hr

Aleksandra Perković, spec. publ. adm., Head of Cabin Crew
Croatia Airlines, Croatian Air Transport Company Ltd.
Bani 75B, Buzin
aleksandra.perkovic@croatiaairlines.hr

ABSTRACT

The main principle of sustainability means being able to meet the needs of today's society without compromising the ability of future generations to meet their own needs. Sustainable development implies the interdependence of its main components: society, economy, and ecology. The prosperity of a society depends on economic progress and the development of new technologies, but in a way that the natural environment is protected and preserved.

This concept is inextricably linked to the concept of ecology and, consequently, to all types of transport, given that transport is considered one of the main pollutants of the ecosystem. Due to its rapid development through history, and as the youngest and safest type of transport, air transport is particularly subjected to the environmental impact assessment. At the same time, air transport affects the global economy due to its connection with other sectors, which in turn enables faster mobility of people, services, and goods. This was especially evident with the increased need for faster medical supplies and protective equipment delivery during the COVID-19 pandemic.

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The European Union's transport policy is geared towards sustainable development by linking all environmental and social goals in a balanced way. Considering the negative long-term impact of COVID-19 on the air transportation sector, the question posed in this paper is whether this can be done in an appropriate way.

As part of the European Green Deal, the "Fit for 55" package is a set of proposals to revise and update EU legislation with the purpose of introducing new initiatives regarding the climate goals agreed by the Council and the European Parliament.

Regarding air transport, the emphasis is on contributing to reducing CO_2 emissions and noise pollution and their impact on other sectors and competitiveness. The EU Commission White Paper: "Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system" emphasizes that the EU aviation industry should become a front-runner in the use of low-carbon fuels to reach the set targets, as well as that the majority of medium-distance passenger transport should go by rail by 2050. There are also initiatives that aviation taxes should subsidize high-speed rail (HSR), which potentially may cause a decrease in the air transport and benefit an increase the rail transport.

The paper will also address the questions as to whether existing legislation, measures, and proposals are appropriate, considering that aviation is one of the industry sectors that is most affected by COVID-19 and could be most affected by the "Fit for 55" package, as well what impact this duopoly might have on the market for travel served by air transport.

Does really "Fit for 55" fit air transport?

Keywords: *air transport, COVID-19 pandemic, ecology, rail transport, sustainability*

1. INTRODUCTION

The development of transport in the 20th, and especially in the 21st century, has significantly contributed to the increase of negative environmental impacts. Traffic has a detrimental effect on air, water, soil, noise production and represents a significant burden in terms of space and transport infrastructure. However, with many NGOs pointing to the problem of environmental pollution, the legislators and participants in transport systems are becoming aware of the enormous pressure of transport on the environment as well as the need to manage this problem. Solving the problem of environmental pollution is a global task that requires the action of all stakeholders, raising global awareness of the importance of this problem as well as the implementation of effective measures and actions with appropriate legal regulations.

When talking about modes of transport, we can say that some are more environmentally friendly (inland waterway transport, rail transport) than others. Air transport is particularly subject to the environmental impact assessment. Still, its positive impact on the world economy should not be overlooked. We have witnessed huge problems as well as enormous financial losses in all modes of transport caused by the COVID-19 pandemic. This was especially evident in air transport

when some fleets were completely grounded. However, it should not be forgotten that air transport played a key role in delivering the necessary medical materials and equipment during the worst periods of the pandemic.[1]

The European Union's transport policy is focused on sustainable development by linking all social and environmental goals in a balanced way. Considering the negative long-term impact of COVID-19 on the air transport sector, we will try to answer the question of whether this can be done in air transport.

The EU Commission White Paper: "Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system"[2] emphasizes that the EU aviation industry should become a frontrunner in the use of low-carbon fuels to reach the set targets, as well as that the majority of medium-distance passenger transport should go by rail by 2050.

In the year 2019 European Commission published the European Green Deal[3], the package of policy initiatives that intend to set the EU on the tracks to a green transition, with the final goal of reaching climate neutrality by 2050. The European Green Deal is also a response to the COVID-19 pandemic, therefore the paper will also show the impact of the COVID-19 pandemic on air and rail transport.

European Union climate and energy policies date from the early 1990s. It should be reminded that, although numerous, the adopted communications are not binding.

In 2021, the EU adopted the European Climate Law (Regulation (EU) 2021/1119), which legally sets the EU's target to become climate-neutral by 2050.[4] According to Article 1 of the Regulation it "establishes a framework for the irreversible and gradual reduction of anthropogenic greenhouse gas emissions by sources and enhancement of removals by sinks regulated in Union law" and emphasizes that it sets a binding objective of climate neutrality in the Union by 2050.

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1 See Vasilj, A.; Činčurak Erceg, B.; Perković, A., *Air Transport and Passenger Rights Protection during and after the Coronavirus (Covid-19) Pandemic*, EU and comparative law issues and challenges series (ECLIC), J. J. Strossmayer University of Osijek, Faculty of Law Osijek, Vol. 5, 2021, pp. 293-325

2 White Paper 'Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system' [2011] COM/2011/144 final

3 Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions - The European Green Deal [2019] COM/2019/640 final

4 Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 [2021] OJ L 243 ('European Climate Law')

In the same year, European Commission presented a series of legislative proposals – the "Fit for 55" package. It is the EU's plan to realize the climate goals of the European Green Deal, and includes a number of proposals for the revision of EU legislation, including transport. This paper will analyse the most important provisions of these documents. The aim of this paper is not to analyse in detail the European Green Deal or "Fit for 55" package, but to present basic documents and changes in environmental objectives related to air transport, compare it with rail transport as a more environmentally friendly solution and express an opinion on whether and how these objectives can be achieved in these modes of transport. The paper also refers to multimodal transport as a more environmentally friendly form of transport and a possible solution to achieve environmental goals.

The paper will also discuss whether existing legislation, measures, and proposals are appropriate for air transport. Namely, air transport is one of the most affected sectors by pandemic COVID-19 and could be significantly affected by the "Fit for 55" package. The paper will also present the relationship between air and rail transport, especially considering the environmental benefits of multimodal transport.

2. SUSTAINABLE DEVELOPMENT AND SUSTAINABLE TRANSPORT

In the past 40 years, a widespread word is sustainability, which most often comes as sustainable development. Sustainable transport, sustainable cities, sustainable economy, sustainable production, and sustainable agriculture are also mentioned very often.

The term sustainable development is defined in different ways, most often the definition from the Brundtland Report, also known as "Our Common Future" of 1987, according to which "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[5] Agenda 21 shows that the concept of sustainable development covers three areas: environment, economy and community.[6] Sustainable development strikes a balance between demands to improve the quality of life (economic component), achieve social welfare and peace for all (social component), and the requirements for the preservation of components the environment

[5] *Report of the World Commission on Environment and Development: Our Common Future*, p. 41. [https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf], Accessed 14 March 2022

[6] Omejec, J., *Uvodna i osnovna pitanja prava okoliša*, in: Lončarić - Horvat, O. (ed.), Pravo okoliša, Ministarstvo zaštite okoliša i prostornog uređenja i Organizator, Zagreb, 2003, p. 31

as a natural asset on which both present and future generations depend.[7] However, the literature points out that the principle of sustainable development is not clear enough in terms of content.[8] However, regardless of its huge popularity in the last two decades of the 20th century, "the concept of sustainable development proved difficult to apply in many cases."[9]

Furthermore, defining the concept of sustainable transport is challenging. Sustainable transport is transport that does not endanger public health or ecosystems and consistently meets transport demand by a) rational use of natural renewable energy; b) rational use of non-renewable energy at a rate less than the speed of development and production of new replacement fuels.[10] Zelenika and Nikolić, by sustainable transport mean environmentally friendly processes production of transport services using environmentally friendly means of work (i.e., transport infrastructure and transport superstructures) that are in the function of human enrichment, space and all development resources, ensuring the greatest possible difference between positive and negative external effects.[11] According to Green and Wegener, when we talk about sustainable transport, threats to sustainability include: "1) degradation of the local and global environment (excessive rates of consumption of renewable resources); 2) consumption of non-renewable resources that appear to be essential to the quality of life of future generations; 3) other institutional failures that exacerbate the previous two problems (e.g., excessive traffic congestion which not only increases pollution and fuel consumption but also generates demand for more infrastructure and all its consequences, such as further urbanization of land and still more vehicle travel)".[12]

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7 Padjen, J., *Održivi razvoj i razvoj prometa*, Suvremeni promet, Vol. 20, No. 1–2, 2000, pp. 11.–14

8 Omejec, *op. cit.*, note 6, p. 32; Cifrić, I., *Okoliš i održivi razvoj: ugroženost okoliša i estetika krajolika*, Razvoj okoliša Biblioteka časopisa „Socijalna ekologija", Filozofski fakultet, Zagreb, 2002, pp. 49-52; Črnjar, M., *Ekonomika i politika zaštite okoliša: ekologija, ekonomija, menadžment, politika*, Ekonomski fakultet Sveučilišta u Rijeci i Glosa, Rijeka, 2002, p. 188; Kuhlman, T.; Farrington, J., *What is Sustainability?,* Sustainability, vol. 2, no. 11, 2010, pp. 3436-3448. Omejec concludes that the modern approach to the environment, which is based on sustainable development, is inherent in trying to achieve three goals: protection of ecosystems and conservation of the originality and biological and landscape diversity of natural communities in their entirety; protection and rational use of natural energy sources and achieving their ecological stability; protection from harmful influences, preservation and restoration of cultural and aesthetic values of the landscape. Omejec, *op. cit.*, note 6, p. 32-33

9 Britannica, *Sustainable development*, [https://www.britannica.com/topic/environmental-law/Sustainable-development#ref224618], Accessed 14 March 2022

10 Vasilj, A.; Činčurak Erceg, B., *Prometno pravo i osiguranje*, Sveučilište Josipa Jurja Strossmayera u Osijeku, Pravni fakultet Osijek, Osijek, 2016, p. 56

11 Zelenika, R.; Nikolić, G., *Multimodalna ekoligija – čimbenik djelotivnornoga uključivanja Hrvatske u europski prometni sustav*, Naše more, Vol. 50, No. 3-4, 2003, p. 142

12 Green, D. L.; Wegener, M., *Sustainable transport*, Journal of Transport Geography, Vol. 5, No. 3, 1997, pp. 178

Padjen states that transport development can be considered sustainable if it develops within the framework of renewable natural resources, meets the requirements of optimality and economic efficiency in the use of available resources, and contributes to improving living conditions and harmonizing relations within the human community.[13]

It is said that traffic has a detrimental effect on all components of the environment, and in the context of this paper, we especially highlight air[14] and noise[15]. The vigorous development of industry and energy use significantly pollutes the air. Since the middle of the 20th century, attempts have been made to regulate the air's protection from pollution completely.[16] Hence, today, many international treaties regulate various aspects of protection against air pollution. Regulations regulating air protection are closely related to many other regulations that primarily do not regulate the protection of air from pollution, which is particularly expressed in regulations relating to transport and which set quality standards for certain products.

The impact of traffic on the level of air pollution is enormous. The most significant impact of transport on the environment is the result of the use of energy in the form of fossil fuels. "Today, transport emissions represent around 25% of the EU's total greenhouse gas emissions, and these emissions have increased over recent years."[17] The most important greenhouse gas is CO_2, which participates with about 60%[18] in creating the greenhouse effect, and its main source is the combustion of fossil fuels. According to statistics in 2019, 31% of the final energy consumption,[19] 25.8% of greenhouse gas emissions[20], and 31.1% of CO_2 emissions[21] in the EU-27 came from transport. Share of greenhouse gas emissions from

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13 Padjen, *op. cit.*, note 7, p. 12

14 See more Lončarić - Horvat, O.; Cvitanović, L.; Gliha, I.; Josipović, T.; Medvedović, D.; Omejec, J.; Seršić, M.; *Pravo okoliša*, Organizator, Zagreb, 2003; Herceg, N., *Okoliš i održivi razvoj*, Synopsis, Zagreb, 2013; Črnjar, M., *Ekonomika i politika zaštite okoliša: ekologija, ekonomija, menadžment, politika*, Ekonomski fakultet Sveučilišta u Rijeci i Glosa, Rijeka, 2002

15 See more Črnjar, *op. cit.*, note 14, p. 39

16 Medvedović, D., *Zaštita nekih dijelova okoliša u hrvatskom pravnom sustavu*, in: Lončarić - Horvat, O. (ed.), Pravo okoliša, Ministarstvo zaštite okoliša i prostornog uređenja i Organizator, Zagreb, 2003, p. 145

17 European Commission, *Transport and the Green Deal*, [https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/transport-and-green-deal_en], Accessed 31 March 2022

18 Črnjar, *op. cit.*, note 14, p. 131

19 European Commission, *EU Transport in Figures - Statistical Pocketbook 2021*, Publications Office, 2021, p. 120, [https://data.europa.eu/doi/10.2832/733836.], Accessed 31 March 2022

20 *Cf. ibid.,* p. 127

21 *Cf. ibid.,* p. 143

transport, by mode of transport, are as follows: road transportation 71.1%, total civil aviation 13.4%, total navigation 14.1%, railways 0.4%, and other 0.5%.[22] According to Communication "Fit for 55", the EU's share of global CO_2 emissions is only 8%.[23]

The European Environment Agency's (EEA) annual "Air quality in Europe" assessments consistently show that air pollution still poses a danger to human health and the environment since the air pollution levels still exceed the EU's legal limits and the World Health Organization's guidelines for the protection of human health.[24] Lockdown measures introduced in 2020 due to the COVID-19 pandemic caused reduced activity in the road, air, and shipping transport, which led to decreases in emissions of air pollutants.[25] However, according to EEA despite reductions in emissions, in 2020, "96% of the EU's urban population was exposed to levels of fine particulate matter above the latest health-based guideline set by the World Health Organization."[26]

Noise is also a type of environmental pollution. Dangerous and harmful noise[27] is generated, among other things, in traffic. The majority of total noise comes from road traffic but is also a problem for the people living near airports and railways. According to EEA Report, air and rail transport are the second and third environ-

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22 *Cf. ibid.,* p. 135

23 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions 'Fit for 55': delivering the EU's 2030 Climate Target on the way to climate neutrality [2021] COM/2021/550 final

24 EEA, *Improving air quality improves people's healthand productivity*, [https://www.eea.europa.eu/signals/signals-2020/articles/improving-air-quality-improves-people2019s], Accessed 2 April 2022

25 EEA, *Vast majority of Europe's urban population remains exposed to unsafe levels of air pollution*, [https://www.eea.europa.eu/highlights/vast-majority-of-europes-urban?utm_medium=email&utm_campaign=Air%20quality%20status%202022&utm_content=Air%20quality%20status%202022+CID_1857e6a51b5c485b39334ceca8eef049&utm_source=EEA%20Newsletter&utm_term=Find%20out%20more], Accessed 5 April 2022

26 EEA, *Europe's air quality status 2022*, [https://www.eea.europa.eu/publications/status-of-air-quality-in-Europe-2022/europes-air-quality-status-2022], Accessed 5 April 2022

27 Extensive literature on the harmful effects of noise on health is available, and we single out e.g. Münzel, T., Sørensen, M., Daiber, A., *Transportation noise pollution and cardiovascular disease*, Nature Reviews Cardiology, vol. 18, 2021, pp. 619–636; Monrad, M., Sajadieh, A., Christensen, J. S., Ketzel M., et al., *Residential exposure to traffic noise and risk of incident atrial fibrillation: A cohort study*, Environment International, Vol. 92–93, 2016, pp. 457-463; Huss, A., Spoerri, A., Egger, M., Röösli, M., *Aircraft Noise, Air Pollution, and Mortality From Myocardial Infarction*, Epidemiology, Vol. 21, Issue 6, 2010, pp. 829-836; Seidler, A. L., Hegewald, J., Schubert, M., Weihofen, V. M., et. al., *The effect of aircraft, road, and railway traffic noise on stroke - results of a case-control study based on secondary data*, Noise Health, vol. 20, 2018, pp. 152-161, Fuks, K. B., Weinmayr, G., Basagaña, X., Gruzieva, O., et. al*., Long-term exposure to ambient air pollution and traffic noise and incident hypertension in seven cohorts of the European study of cohorts for air pollution effects (ESCAPE)*, European Heart Journal, vol. 38, issue 13, 2017, pp. 983-990

mental noise sources in Europe.[28] The impacts of air traffic mostly occur during landing and take-off while rail has an impact during the entire route.[29] The Environmental Noise Directive (Directive 2002/49/ EC)[30] sets the general framework for environmental noise management in the EU. For rail Commission Regulation (EU) No 1304/2014 of November 26th 2014 on the technical specification for interoperability relating to the subsystem' rolling stock — noise'[31] is in force. Annex 16 "Environmental Protection" (Volumes I and II) of the Convention on International Civil Aviation deals with the protection of the environment from the effect of aircraft noise and aircraft engine emissions.[32] As Medvedović points out, strict international rules have been created since airplanes make noise worldwide.[33] In 2001 the International Civil Aviation Organization (ICAO) Assembly adopted the Balanced Approach to Aircraft Noise Management, that identifies four elements[34] to address noise around airports. It looks at a specific airport and analyses measures to reduce noise individually. In 2014, Regulation (EU) No 598/2014 on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Union airports within a Balanced Approach and repealing Directive 2002/30/EC was adopted in the EU.[35] "Aircraft today are, on average, 20 decibels quieter than thirty years ago, leading to a 75 percent reduction in noise annoyance around airports."[36] Despite various conditions and

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28 EEA, *Report No 19/2020, Train or plane?,* Transport and environment report 2020, p. 26, [https://www.eea.europa.eu/publications/transport-and-environment-report-2020], Accessed 5 April 2022

29 *Ibid.* As stated in the Report, according to the WHO „the number of people exposed to air traffic noise is smaller than for rail, but the annoyance response to air traffic noise is larger than for rail noise."

30 Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise - Declaration by the Commission in the Conciliation Committee on the Directive relating to the assessment and management of environmental noise [2002] OJ L 189

31 Commission Regulation (EU) No 1304/2014 of 26 November 2014 on the technical specification for interoperability relating to the subsystem 'rolling stock — noise' amending Decision 2008/232/EC and repealing Decision 2011/229/EU [2014] OJ L 356

32 ICAO, The Convention on International Civil Aviation, Annexes 1 to 18, [https://www.icao.int/safety/airnavigation/nationalitymarks/annexes_booklet_en.pdf], Accessed 5 April 2022

33 Medvedović, D., *op. cit*., note 16, p. 173

34 These are: reduction at source, land-use management and planning, noise abatement operational procedures, and operating restrictions. ICAO, *Environment, Aircraft Noise*, [https://www.icao.int/environmental-protection/pages/noise.aspx], Accessed 5 April 2022

35 Regulation (EU) No 598/2014 of the European Parliament and of the Council of 16 April 2014 on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Union airports within a Balanced Approach and repealing Directive 2002/30/EC [2014] OJ L 173

36 Gudmundsson, S. V., *European Air Transport Regulation: Achievements and Future Challenges*. Available at SSRN: [https://ssrn.com/abstract=2621815] or [http://dx.doi.org/10.2139/ssrn.2621815], Accessed 31 March 2022, p. 28

measures aimed at reducing air traffic noise, it is still high due to high air traffic intensity.

Although traffic has a harmful effect on the environment, its positive impact on the economy is undeniable. Črnjar emphasizes that traffic has a dual and opposite function: it is important for the integration of the economy of various countries, but also causes great social costs (environmental damage).[37] Transport employs more than 10 million people in Europe and contributes around 5% to EU GDP.[38] So, decision makers have to balance between actions developing and promoting transport along with increasing mobility, and on the other side reduce its negative effect on air quality and environment.

3. EUROPEAN ENVIRONMENT PROTECTION DOCUMENTS

European Union documents related to transport modes and their impact on the environment cover different areas such as alternative fuels, emission standards, fuel efficiency, etc. According to Činčurak Erceg and Jerković "new regulations, documents, strategies, and measures are being continuously adopted. However, the European Union, as well as all the Member States, has a difficult path for the realization of the planned objectives."[39]

Among numerous documents, there are:

- White Paper "European transport policy for 2010: time to decide"[40] of 2001 that highlights the need for integration of transport in sustainable development. It additionally emphasises the need for shifting between modes, from road to rail, sea, and inland waterways; revitalising the railways; eliminating bottlenecks; taking care of transport users, establishing a balance between air traffic growth and the environment, etc.

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37 Črnjar, *op. cit.*, note 14, p. 39

38 European Commission, *Transport and the Green Deal*, [https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/transport-and-green-deal_en], Accessed 31 March 2022. Air transport is one of the key drivers of mobility in the European Union as well as the development of its economy. According to estimates, 0.4 million people were employed in the European Union in the aerospace industry in 2018, and 1.2 billion passengers were transported in the same year. The share of the aerospace industry in 2017 in the GDP of the European Union was 2.1%. Proposal for a Regulation of the European Parliament and of the Council on ensuring a level playing field for sustainable air transport [2021] COM(2021) 561 final

39 Činčurak Erceg, B.; Jerković, E., *Sustainable Transport – Legal and Financial Aspects*, 6th SWS International Scientific Conference on Arts and Humanities, Florence, Italy, Conference Proceedings, Vol. 6, Issue 2, 2019, p. 87

40 White Paper 'European transport policy for 2010: time to decide' [2001] COM (2001) 370 final

- White Paper "Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system"[41] of 2011 aims at reducing by 60% greenhouse gas (GHG) emissions from transport by 2050, measured with respect to 1990 levels,[42] by limiting the increasing level of road congestions and building efficient intermodal connections. It also highlights that transport has become more energy-efficient but still depends on oil and oil products for 96% of its energy needs.[43] Thus, this White Paper calls for reducing the oil dependence of transport. For that reason, alternative fuels and the appropriate infrastructure are of great importance. One of the White Paper's goals is that the majority of medium-distance passenger transport should go by rail by 2050. It was stated in the White Paper that "the EU aviation industry should become a frontrunner in the use of low-carbon fuels to reach the 2050 target."[44] However, as stated in Communication "Clean power for transport: A European alternative fuels strategy":[45] "for certain modes of transport, in particular long-distance road freight and aviation, limited alternatives are available."

In the year 2019 European Commission published the European Green Deal that includes initiatives covering the environment, climate, transport, energy, industry, agriculture, and sustainable finance.[46] It is "an integral part of this Commission's strategy to implement the United Nation's 2030 Agenda and the sustainable development goals." The European Green Deal represents the EU's greater climate ambition for 2030 ("to increase the EU's greenhouse gas emission reductions tar-

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41 White Paper 'Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system' [2011] COM/2011/144 final

42 *Cf. ibid.,* p. 3

43 *Cf. ibid.,* p. 4

44 *Cf. ibid.,* p. 7
Benchmarks for achieving the 60% GHG emission reduction target: low-carbon sustainable fuels in aviation; moving 30% by 2030, and by 2050 more than 50% of road transport of goods over distances longer than 300 km to other modes of transport; connecting all core network airports to the rail network by 2050; creating a fully functional and EU-wide multimodal TEN-T core network by 2030

45 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – 'Clean power for transport: A European alternative fuels strategy' [2013] COM (2013) 17 final

46 See more: Krämer, L., *Planning for Climate and the Environment: the EU Green Deal*, Journal for European Environmental & Planning Law, Vol. 17, No. 3, 2020, pp. 267-306.; Fleming, R.; Mauger, R., *Green and Just? An update on the 'European Green Deal'*, Journal for European Environmental & Planning Law, Vol. 18, No. 1-2, 2021, pp. 164-180.; Skjærseth, J. B., Towards a European Green Deal: The evolution of EU climate and energy policy mixes, International Environmental Agreements: Politics, Law and Economics, vol. 21(1), 2021, pp. 25-41

get for 2030 to at least 50% and towards 55% compared with 1990 levels")[47] and 2050 ("no net emissions of greenhouse gases in 2050"; to achieve climate neutrality by 2050). It emphasizes the need to accelerate the transition to sustainable and smart mobility. It stresses that transport accounts for a quarter of the EU's greenhouse gas emissions, and still increasing. So, to reach climate neutrality, a 90% reduction in transport emissions is required by 2050.[48] However, it should not be forgotten that the European Green Deal is "a policy or an instrument of the EU soft-law".[49]

As was stated in the Communication "Stepping up Europe's 2030 climate ambition Investing in a climate-neutral future for the benefit of our people" (the 2030 EU Climate target plan) "all transport sectors - road, rail, aviation and waterborne transport - will have to contribute to the 55% reduction effort."[50] In the Communication "Sustainable and Smart Mobility Strategy – putting European transport on track for the future", it was proposed that the use of electricity in rail transport should be increased and when this is not possible, the use of hydrogen.[51] It is warned that air and waterborne transport will have "greater decarbonisation challenges in the next decades, due to current lack of market ready zero-emission technologies, long development and life cycles of aircraft and vessels, the required significant investments in refuelling equipment and infrastructure, and international competition in these sectors."[52] Many studies point that traffic growth will cause increasing emissions from aircrafts in spite of technological developments.[53]

After many soft law instruments the European Climate Law (Regulation (EU) 2021/1119) was adopted in 2021. It creates a binding commitment of the

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47 As Skjærseth states EU commited to 8% emissions reduction from the Kyoto Protocol's first commitment period (2008–2012), plan have increased to 20% emissions reduction by 2020 and 40% by 2030 (compared to 1990 levels), and in the end the European Council raised the 2030 target to 55%. Skjærseth, J. B., Towards a European Green Deal: The evolution of EU climate and energy policy mixes, International Environmental Agreements: Politics, Law and Economics, vol. 21(1), 2021, p. 26

48 The European Green Deal, *op. cit.*, note 3, p. 10

49 See more in Sikora, A., *European Green Deal – legal and financial challenges of the climate change*, ERA Forum, Vol. 21, 2021, pp. 688-689

50 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – Stepping up Europe's 2030 climate ambition Investing in a climate-neutral future for the benefit of our people [2020] COM/2020/562 final

51 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – Sustainable and Smart Mobility Strategy – putting European transport on track for the future [2020] COM/2020/789 final

52 *Ibid*

53 D'Alfonso, T.; Jiang, C.; Bracaglia, V., *Air transport and high-speed rail competition: Environmental implications and mitigation strategies*, Transportation Research Part A, Vol. 92, 2016, p. 261-262

Member States to achieve of climate neutrality in the Union by 2050 compared with 1990 and contains a qualitative objective to improve adaptation to climate change.

The initiative included in the European Green Deal is "Fit for 55" package[54] adopted in 2021. To achieve the goal and become climate neutral by 2050, current greenhouse gas emission levels must drop. "The Fit for 55" package is a set of proposals to revise and update EU legislation and to put in place new initiatives with the aim of ensuring that EU policies are in line with the climate goals agreed by the Council and the European Parliament."[55] Among other things, the package includes: a revision of the rules for aviation emissions, ReFuelEU Aviation for sustainable aviation fuels[56], a revision of the Directive on the deployment of alternative fuels infrastructure.[57] In the Communication "Fit for 55", Commission proposed that by 2030 sectors covered by the revised EU Emissions Trading Scheme have to reduce their GHG emissions by 61%, compared to 2005 levels.[58]

The Commission is additionally proposing carbon pricing for the aviation sector, which benefited from an exception until now. "It is also proposing to promote sustainable aviation fuels – with an obligation for planes to take on sustainable blended fuels for all departures from EU airports."[59] If we consider that sustainable aviation fuels (advanced biofuels and electro-fuels) represent only 0.05% of

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54 'Fit for 55', *op. cit.*, note 23
The following activities were adopted: Proposal for a carbon border adjustment mechanism (CBAM) for selected sectors; Revision of the Regulation on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry (LULUCF); Revision of the EU Emissions Trading System (ETS); Revision of the Energy Tax Directive; Amendment to the Renewable Energy Directive; Amendment of the Energy Efficiency Directive; Revision of the Directive on deployment of alternative fuels infrastructure; Revision of the Regulation setting CO_2 emission performance standards for new passenger cars and for new light commercial vehicles. European Parliament *Legislative train schedule Fit for 55 package under the European Green Deal*, [https://www.europarl.europa.eu/legislative-train/theme-a-european-green-deal/package-fit-for-55], Accessed 8 April 2022

55 European Council, Council of the European Union, *Fit for 55*, [https://www.consilium.europa.eu/en/policies/green-deal/fit-for-55-the-eu-plan-for-a-green-transition/], Accessed 1 April 2022

56 The ReFuelEU Aviation initiative promotes sustainable aviation fuels, and theirs suppliers are becoming increasingly obliged to combine them with existing fuel for jet engines supplying aircraft at EU airports; in addition, the use of synthetic fuels will be encouraged

57 European Council, Council of the European Union, *op. cit.*, note 55
Still, Schlacke, Wentzien, Thierjung and Kösterx emphasize that "Commission's timetable for the legislative process can only be qualified as ambitious and justifies the prognosis that it is almost impossible to meet." Schlacke, S., Wentzien, H., Thierjung, E.-M., Kösterx, M., *Implementing the EU Climate Law via the 'Fit for 55' package*, Oxford Open Energy, vol. 1, 2022, p. 11

58 'Fit for 55', *op. cit.*, note 23

59 European Commission, *Delivering the European Green Deal*, [https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/delivering-european-green-deal_en], Accessed 31 March 2022

total jet fuel consumption,[60] the question arises as to how and whether aviation will succeed in implementing these measures. Recently some airlines supported by IATA have been lobbying against EU climate plans trying to influence European Commission to implement ICAO Carbon Offsetting and Reduction Scheme rather than EU-s carbon policies.[61] European biofuels obligation could undermine the position between European and non-European airlines because European airlines are burdened by aviation tax, EU Emission Trading System (ETS), and as well with CORSIA, while non-EU airlines operate under completely different environmental standards and obligations.[62] Taxation is not the only solution to deal with environmental challenges. IATA also warned that the „reliance on taxation as the solution for cutting aviation emissions in the EU's 'Fit for 55' proposal is counter-productive to the goal of sustainable aviation."[63] The aviation industry is determent to „go green" and to reach net-zero emissions by 2050 on its own, however, the European Green Deal needs a reboot considering the COVID-19 impact on aviation, especially since the „Fit for 55" proposal does not include specific measures to reduce sustainable aviation fuels (SAF) costs or to incentivize production and the use of alternative fuels. Aviation must be looked at globally, not only from the EU standpoint. An unbalanced tax system makes higher taxes on aviation and shipping, affecting technological development as well.[64]

In our opinion it necessary to find the common ground to implement joint agreements like CORSIA, because different measures will only open new discussions and postpone results. Instead of taxation, it is needed to implement and revise different measures but primarily to support the development of the new technologies such as electric, hydrogen or hybrid aircraft. All income from taxation and carbon pricing schemes must be transparently invested into developing those measures.

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60 European Commisision, *Sustainable aviation fuels – ReFuelEU Aviation*, [https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12303-Sustainable-aviation-fuels-ReFuelEU-Aviation_en], Accessed 9 April 2022

61 Vaughan, A., *European airlines have been lobbying against EU climate plans,* New Scientist, 2021, [https://www.newscientist.com/article/2280172-european-airlines-have-been-lobbying-against-eu-climate-plans/], Accessed 12 April 2022

62 *Ibid.*

63 IATA, *Tax is not the answer to aviation sustainability*, [https://www.airlines.iata.org/analysis/tax-is-not-the-answer-to-aviation-sustainability], Accessed, 5 May 2022

64 Ovaere, M.; Proost, S., Cost-effective reduction of fossil energy use in the Eeuropean transport sector: An assessment of the Fit for 55 package, Working Papers of Faculty of Economics and Business Administration, Ghent University, Belgium, 21/1031, 2021, p. 24

4. IMPACT OF THE COVID-19 PANDEMIC ON AIR AND RAIL TRANSPORT

At the end of 2019 several cases of nonspecific pneumonia were reported in Wuhan, Hubei province in China.[65] Rapid spread of the virus later named SARS-Cov-2, led to World Health Organisation (WHO) to declare coronavirus pandemic on March 11th 2020.[66]

The COVID-19 pandemic took our society by surprise and affected all travel sectors in a way that passenger transport within European Union (EU) member states was partially or entirely closed. Since the pandemic's beginning, countries worldwide and in the EU have taken various measures to limit coronavirus spread. "The pressure on organizations during this coronavirus pandemic has shifted from moving citizens to keeping a core transportation system operational with a skeleton workforce to ensure freight and key essential workers can continue to move."[67]

4.1. Impact of the COVID-19 pandemic on rail transport

The COVID-19 pandemic has significantly affected rail transport as well. Partial or complete shutdown of several rail activities caused by imposed lockdown measures led to a drop in passenger demand, causing a significant economic impact on the rail sector.[68] Although lower cases of disruption characterized rail services at the beginning of the pandemic than the other transport modes, in the fourth quarter of 2020, there was a decrease in rail transport in EU states, around 45% percent on average

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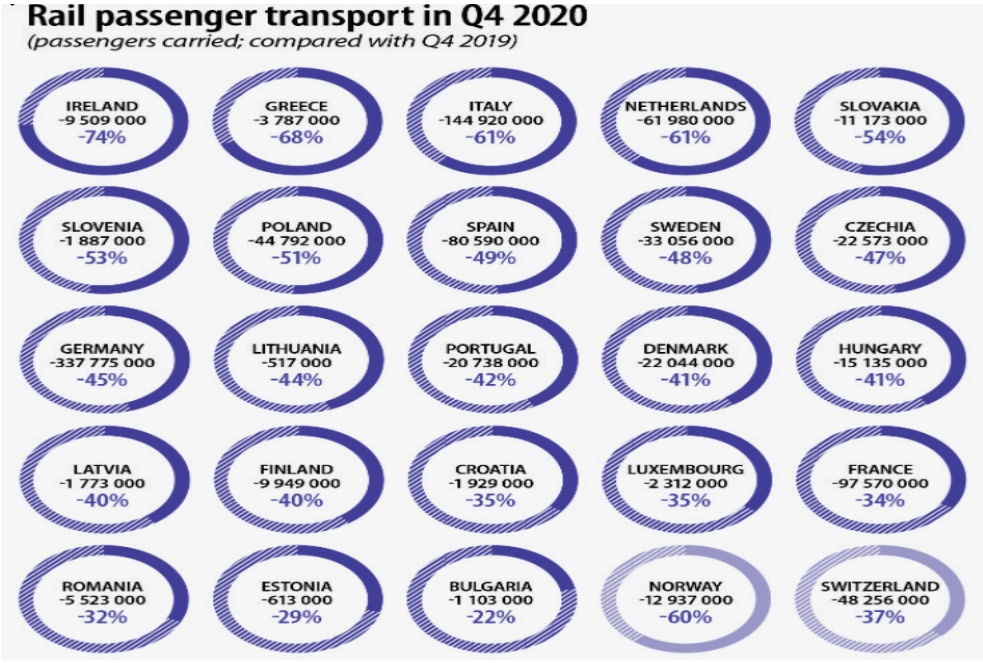
65 World Health Organisation, Regional Office for Europe, *Coronavirus disease (COVID-19) pandemic*, [https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/novel-coronavirus-2019-ncov], Accessed 6 February 2022

66 *Ibid.* See Vasilj, Činčurak Erceg, Perković, *op. cit.*, note 1

67 Deloitte, *Understanding COVID-19's impact on the transportation sector, COVID-19's growing impact on the transportation sector,* [https://www2.deloitte.com/us/en/pages/about-deloitte/articles/covid-19/covid-19-impact-on-transportation-sector.html], Accessed 13 February 2022

68 Independent Regulator's Group-Rail, *Impact of the COVID-19 crisis and national responses on European railway markets in 2020,* [IRG-Rail__2021__5_____Covid_publication_2021.pdf URL -MwGiT6rl-wyt6PZyeAm0], Accessed 19 February 2022

Figure 1. Decrease in rail transport in fourth quartal 2020.



Source: Eurostat, *Impact of the COVID-19 pandemic on rail passenger transport in Q4 2020*, [https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20210518-1], Accessed 7 February 2022

To counteract the negative economic effects of the COVID-19 outbreak, temporary and permanent financial measures were adopted:

- adjustments regarding charging principles: postponing of the invoicing, discounts, loosening of cancellation charges and reservation penalties;
- state aids: compensation of loss of revenue including incentives;
- higher public subsidies;
- convenient Public Service Obligation (PSO) contracts.[69]

On October 7th, 2020, the European Parliament and the Council of the European Union adopted a Regulation EU 2020/1429 establishing measures for a sustainable rail market in view of the COVID-19 outbreak.[70] This Regulation provides measures regarding the impact of COVID-19 on the rail sector, addressing the Member States to authorize infrastructure managers to lower, postpone or

[69] *Ibid.*

[70] Regulation (EU) 2020/1429 of the European Parliament and of the Council of 7 October 2020 establishing measures for a sustainable rail market in view of the COVID-19 outbreak [2020] OJ L 333

remove specific charges prescribed in Directive 2012/34/EU establishing a single European railway area.[71]

This Regulation substitutes the actual regulation framework; considering Article 31 of Directive 2012/34/EU, a partial or full waiver of track access charges is recommended in order to alleviate the impact of COVID-19. Under Article 32 of the same Directive, it is allowed for the Member States to levy mark-ups if the market can bear them. However, Regulation EU 2020/1429 prescribes that the Member States can authorize infrastructure managers to reassess their ability to bear mark-ups and to reduce the amounts due considering the impact of the COVID-19 pandemics.[72] Reservation charges intended to incentivize the efficient use of capacity are not considered relevant as well for the period of the pandemic.[73]

On December 15th 2020, the European Parliament approved a proposal by the European Commission[74] to designate 2021 as the European Year of rail. The main goal was to promote rail transport as safe and sustainable as stated in the Proposal for a decision of the European Parliament and of the Council on a European year of rail: "Rail, therefore, needs a further boost to become more attractive to travellers and businesses as a mean of transport that meets both their daily and more long distance mobility needs."[75] The year's main goal was to encourage passengers to choose rail over more polluting transport modes like air travel.[76] As the impact of the COVID-19 pandemic postponed and disrupted planned activities in 2021 many rail associations require that European Commission prolong the European Year of rail to the end of 2022.[77]

Although the COVID-19 crisis has significantly reduced travel in general, rail has demonstrated a certain way of resilience with the opportunity even to strengthen its position and competitiveness. It is important to underline that there is no change in the trend toward public financing in rail transport, and subsidy levels will stay permanent in the future years. With The European Year of the rail, new programs are set to reduce the pandemic's impact and encourage a shift from other

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71 Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area [2012] OJ L 343

72 *Ibid.*

73 *Ibid.*

74 Proposal for a Decision of the European Parliament and of the Council on a European Year of Rail [2021] COM/2020/78

75 *Ibid.*

76 Goulding Carroll, S., Rail and aviation set for showdown over 2022 'European Year of' status, 2021, [https://www.euractiv.com/section/railways/news/rail-and-aviation-set-for-showdown-over-2022-european-year-of-status/], Accessed 24 February 2022

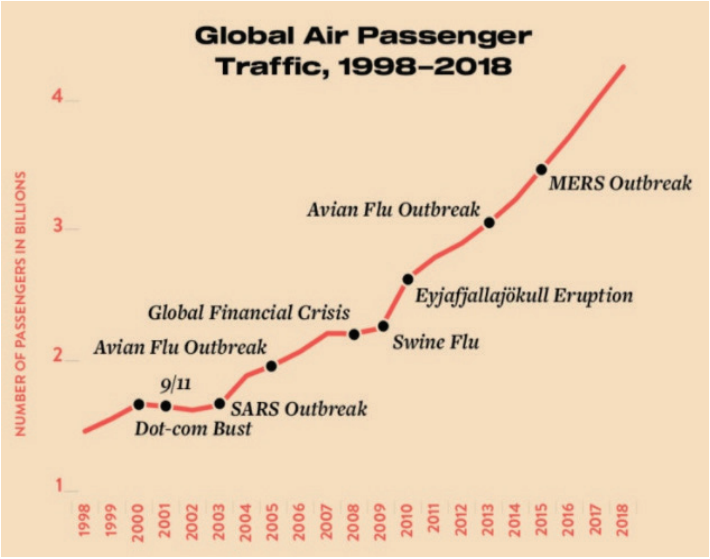
77 *Ibid.*

transport modes, especially air.[78] Despite challenges, the impact of the pandemic has created a fertile ground for the development of rail transport with some favorable conditions set for winning the market share during the recovery period, strengthening competitiveness with the increase of its modal contribution.[79]

4.2. Impact of COVID-19 on air transport

Since the beginning of the 21st century, the aviation sector has been affected by many crises: SARS outbreak, H5N1 influenza, global financial crisis, H1N1 pandemic, the eruption of Iceland's Eyjafjallajökull[80], Ebola, MERS, Zika virus and finally COVID-19.

Figure 2. Impact of the crisis on global air passenger traffic



Source: Sehl, K., *How the Airline Industry Survived SARS, 9/11, the Global Recession and More, APEX, 2020*, [https://apex.aero/articles/aftershocks-coronavirus-impact/], Accessed 5 March 2022

Worsening of the epidemiological situation around the world at the beginning of 2020 significantly affected air transport making it one of the hardest-hit industries

[78] International Union for Railwas, Mobility post - Covid: An opportunity for railways, 2021, [https://uic.org/IMG/pdf/mobility-post-covid-an-opportunity-for-railways.pdf], Accessed 25 February 2022.

[79] The World Alliance of Tourist Trams and Trains, Mobility post-Covid: an opportunity for rail transport.(UIC), 2022, [https://uic.org/IMG/pdf/mobility-post-covid-an-opportunity-for-railways.pdf], Accessed 26 Ferbuary 2022

[80] Sehl, K., How the Airline Industry Survived SARS, 9/11, the Global Recession and More, APEX, 2020, [https://apex.aero/articles/aftershocks-coronavirus-impact/], Accessed 5 March 2022

by COVID-19.[81] Only in March 2020, there was a decrease in air transport by more than 60% on average compared to 2019.

Figure 3. Air passenger transport in March 2020 (% change compared with March 2019)

Source: Eurostat, *Impact of COVID-19 on air passenger transport,* [https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20200616-2], Accessed 27 February 2022

COVID-19 pandemic caused disruption like nothing before, facing aviation with an unprecedented crisis. By the end of 2020, the economic impact of COVID-19 on the aviation sector was more significant than 30 SARS outbreaks, with the projection of financial shock "three times greater than the steepest downturn of the 2008 global financial crisis."[82] The aviation sector is closely intertwined with tourism facilitating 87.7 million jobs worldwide,[83] and in Europe, there is more than 3.3% of all employment supported by aviation.[84] According to the latest International Air Transport Association (IATA) research, the severe decline in air transport caused by the COVID-19 pandemic might result in the loss of 44.6 million aviation-supported jobs.[85] The recovery projections are not promising since the return to pre-COVID global passenger traffic levels is not expected before

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81 Bao, X.; Ji, P.; Lin, W.; Perc, M., Kurths, J.; *The impact of COVID-19 on the worldwide air transportation network,* Royal society open science, Vol. 8, 2021, [https://doi.org/10.1098/rsos.210682], Accessed 27 February 2022

82 *Ibid.*

83 Airlines, New figures highlight potential job losses, 2021, [https://www.airlines.iata.org/news/new-figures- highlight-potential-job-losses], Accessed 6 March 2022

84 Air Transport Action Group (ATAG), Aviation benefits beyond borders, [https://aviationbenefits.org/media/166711/abbb18_full-report_web.pdf], Accessed 10 March 2022, p. 44

85 Airlines, *op. cit.*, note 83

2024.[86] To boost air transport and to contribute to the recovery, there is an initiative to the European Commission to declare 2022 the European Year of Aviation and to provide "a unique opportunity to reflect on the present and, above all, the future of an innovative and research-intensive sector, fully committed to embrace and address the challenges of sustainability and digitalization and to contribute to the growth and well-being of European citizens."[87]

From the beginning of the pandemic, the main focus of the aviation industry has been to mitigate the impact on safety and to ease passenger concerns regarding safe travel by implementing various measures to reduce the possibility of disease transmission. Previously developed health standards developed by World Health Organization, IATA, and International Civil Aviation Organization (ICAO) were accepted and implemented by national regulations. Most countries also have implemented strict measures such as travel restrictions, border closures, quarantines, and social distancing, which significantly impact aviation.

European Union Aviation Safety Agency (EASA) together with the European Centre for Disease Prevention and Control, published special guidance: COVID-19 Aviation Health Safety Protocol – Operational guidelines for the management of air passengers and aviation personnel in relation to COVID-19 pandemic, a document that provides best practices and procedures with the purpose of protecting public health and preventing the spread of SARS-Cov-2.[88]

Due to the reduced number of flights, there was a challenge to deliver humanitarian aid and medical supplies. Therefore EASA has issued a temporary permit for airlines to transport this specific cargo in the passenger cabin[89] as exemptions under Article 71(1) of Regulation 2018/1139 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency.[90]

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86 IATA, Recovery delayed as international travel remains locked down, 2020, [https://www.iata.org/en/pressroom/pr/2020-07-28-02/], Accessed 10 March 2022

87 Aviation24.be, 2021, The Sky & Space Intergroup of the European Parliament calls on European Commissioto declare 2022 European Year of Aviation, [https://www.aviation24.be/organisations/european-parliament/the-sky-space-intergroup-of-the-european-parliament-calls-on-european-commission-to-declare-2022-european-year-of-aviation/], Accessed 14 March 2022

88 Vasilj, Činčurak Erceg, Perković, op. cit., note 1, p. 302

89 See: EASA, Guidelines transport of cargo in passenger compartment - exemptions under article 71(1) of Regulation 2018/1139 (The Basic Regulation), [https://www.easa.europa.eu/downloads/113496/en], Accessed 12 March 2022

90 Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91 [2018] OJ L 212

At the end of 2020 IATA highlighted four important segments where government assistance is needed to assist airlines in recovery:

1. Extending the waiver from the 80-20 use-it-or-lose-it rule in the Worldwide Airport Slot Guidelines offering more flexibility to airline operators to plan schedules,
2. Continued financial assistance,
3. Extensions to wage subsidies and corporate taxation relief measures,
4. Avoiding increases in charges and fees.[91]

Unlike rail transport, there were no temporary and permanent financial measures adopted at the EU level to counteract the negative economic effects of the COVID-19 outbreak. However, it was left to the governments to implement certain measures.[92]

The European Commission has published Interpretative Guidelines on EU passenger rights regulations in the context of the developing situation with COVID-19[93] which "aim at clarifying how certain provisions of the EU passenger rights legislation apply in the context of the Covid-19 outbreak, notably with respect to cancellations and delays."[94] These Interpretative Guidelines also apply to Regulation (EC) No 261/2004 of the European Parliament and of the Council establishing common rules on compensation and assistance to passengers in the event of denied boarding and of cancellation or long delay of flights. According to Article 8 of the Regulation (EC) No 261/2004 passengers have the right to reimbursement within seven days of the full cost of the ticket at the price at which it was bought, a return flight to the first point of departure at the earliest opportunity.[95] The prescribed obligation to compensate passengers in the event of flight cancellation generated high costs for the airlines.

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91 IATA, *Continued Government Relief Measures Needed to get Airlines through the Winter,* [https://www.iata.org/en/pressroom/pr/2020-06-16-01/], Accessed 13 March 2022

92 See: Deloitte, *Global COVID-19 Government Response,* 2020, [https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/corporate-finance/deloitte-global-covid19-government-response-070420.pdf], Accessed 13 March 2022

93 Commission Notice Interpretative Guidelines on EU passenger rights regulations in the context of the developing situation with Covid-19 [2020] OJ C 89I

94 *Ibid.*

95 Regulation (EC) No 261/2004 of the European Parliament and of the Council of 11 February 2004 establishing common rules on compensation and assistance to passengers in the event of denied boarding and of cancellation or long delay of flights, and repealing Regulation (EEC) No 295/91 (Text with EEA relevance) - Commission Statement

Due to the pandemic, many passengers even cancelled their flights. The legislation does not cover this situation, but in order to keep their passengers, the airlines offered a voucher with a new travel date. In order to minimize the costs for reimbursement, twelve[96] European countries required the European Commission to suspend the prescribed obligation to offer a full refund for canceled flights and allow airlines to choose how passengers are reimbursed. The European Commission adopted Recommendation (EU) 2020/648 on vouchers offered to passengers as an alternative to reimbursement[97] but in a way that passengers can choose between cash and voucher, stating that airlines should make vouchers more attractive so that consumers will accept them instead of the reimbursement.[98]

According to the IATA data from March 2022, there's a significant increase in air travel,[99] unfortunately, some airports like Amsterdam Schiphol Airport supported by the Dutch competition regulator decided to raise airport charges by 37% in the next three years.[100] In this way aviation sector, airlines and passengers are more burdened, and this is not the way to incentivize and support aviation after the COVID-19 pandemic. Decisions like this on a national level will further drain airline resources to invest in new technologies and fleet renewal to reach Net Zero goals.

5. MULTIMODAL TRANSPORT

Using multimodal transportation[101], as modern mode of transport has a significant role in the ecology. According to Zelenika and Nikolić, the multimodal transport

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96 Belgium, Bulgaria, Cyprus, Czech Republic, France, Greece, Ireland, Latvia, Malta, the Netherlands, Poland and Portugal. Morgan, S., *Twelve countries demand passenger rights suspension*, EURACTIV, 2020, [https://www.euractiv.com/section/aviation/news/twelve-countries-demand-passenger-rights-suspension/], Accessed 14 March 2021

97 Commission Recommendation (EU) 2020/648 of 13 May 2020 on vouchers offered to passengers and travellers as an alternative to reimbursement for cancelled package travel and transport services in the context of the COVID-19 pandemic, C/2020/3125 [2020] OJ L 151/10

98 Vasilj, Činčurak Erceg, Perković, *op. cit.,* note. 1, p. 314

99 IATA, *Passenger Traffic Recovery Continues in March*, 2022, [https://www.iata.org/en/pressroom/2022-releases/2022-05-04-01/], Accessed 20 May 2022

100 Dunn, G., *Why sparks are flying over airport charges post-pandemic,* 2022, [https://www.flightglobal.com/networks/why-sparks-are-flying-over-airport-charges-post-pandemic/148373.article], Accessed 22 May 2022

101 „The multimodal transport definitions in the legal sense are most often related to the characteristics of multimodal transport, as stated in the United Nations Convention on the Multimodal Transportation of Goods of 1980." Erceg, A.; Činčurak Erceg, B.; Kilic, Z., *Multimodal Transportation – Economic and Legal Viewpoint from Croatia and Turkey*, Proceedings of the 20th International Scientific Conference Business Logistics in Modern Management (Dujak, D., ed.), Faculty of Economics in Osijek, Osijek, 2020., pp. 48. According to Article 1(1) of the Convention on the Multimodal Transportation of Goods „international multimodal transport means the carriage of goods by at least two different

is considered the ecological and modern form of traffic because it offers an effective, fast and secure way of transportation of goods, and it also protects the human environment to significant extent. Therefore, the development of multimodal transport with the application of modern transport technologies and certain and concrete environmental protection measures should be of dominant importance in all developed economies of the world.[102] As the main advantages of multimodal transport Sładkowski states: fuel savings, reduction of harmful emissions, higher energy efficiency, fewer external costs, less noise, reducing climate change, etc.[103]

The development of multimodal transport technologies is part of the European transport policy. It has been included in the main strategic documents of the EU: The White Paper of 1992 on the future development of common transport policy, the White Paper of 2001, "European transport policy for 2010: time to decide" and the White Paper of 2011 "Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system". The 2011 Transport White Paper states that all core network airports should be linked to the railway network , preferably high-speed by 2050.

The European Commission tried to raise the importance of multimodality for EU transport during the 2018 "Year of Multimodality". As was stated by Erceg, Činčurak Erceg and Kilic, "it appears that these actions are more focused on promoting multimodal transport and highlighting its advantages, which will ultimately lead primarily to a reduction of pollution, congestion, and costs rather than they aimed at passing legislation."[104]

The main advantages of multimodal transport consist of: saving costs and time by using each mode of transport optimally; better utilisation of the capacity as a result of optimal use of each mode; lower energy consumption; reduction of the harmful effect of transport on the climate and the environment.[105] Therefore, in connection with the development of sustainable transport, many states are

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modes of transport based on a multimodal transport contract from a place in one country at which the goods are taken in charge by the multimodal transport operator to a place designated for delivery situated in a different country." United Nations Treaty Collection, United Nations Convention on International Multimodal Transport of Goods, [https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XI-E-1&chapter=11&clang=_en], Accessed 4 April 2022

102 Zelenika R., Nikolić, G., *Multimodalna ekologija – čimbenik djelotvornoga uključivanja Hrvatske u europski prometni sustav*, Naše more, Vol. 50, No. 3-4, 2003, p. 138

103 Pencheva, V., Asenov, A., Sladkowski, A., Ivanov, B., Georgiev, I., *Current Issues of Multimodal and Intermodal Cargo Transportation* in: Sładkowski, A. (ed.), Modern Trends and Research in Intermodal Transportation, Studies in Systems, Decision and Control, Vol. 400, Springer, 2022, p. 74

104 Erceg, Činčurak Erceg, Kilic, *op. cit.*, note 101, p. 51

105 Pencheva, Asenov, Sladkowski, Ivanov, Georgiev, *op. cit.*, note 103, p. 61

promoting multimodal transport development through the use of rail and water transport. "These sustainable options are developing as alternatives of the most common modes of transport—road and air, which are the least sustainable choice of mode."[106]

The importance and necessity of multimodal transport are also emphasized in Communication Sustainable and Smart Mobility Strategy – putting European transport on track for the future (ports and airports should become hubs of multimodal mobility, thus improving air quality at the local level).[107] It is also highlighted that "the COVID-19 pandemic has demonstrated how increased multimodality is also crucial to improving the resilience of our transport system and how ready the public is to embrace sustainable alternative modes of travel."

According to the European Green deal and "Fit for 55" package, European transport is based on the multimodal system, which should improve connectivity and internal market between all regions. It is expected that an interconnected multimodal transport system should be based on an "affordable high-speed rail network, abundant recharging and refueling infrastructure for zero-emission vehicles and supply of renewable and low-carbon fuels."[108]

Multimodal transport as a more environmentally friendly form of transport can certainly serve as a way to achieve environmental goals. However, this form of transport needs to be more promoted and encouraged, but also the existing legal framework needs to be adapted.

6. "FIT FOR 55" AND SHIFTING FROM AIR TO RAIL TRANSPORT

Mobility and transport enable and simplify our economic and social life. Traveling leads to greater cohesion and empowers European identity.[109] To achieve carbon-neutral transport by 2030 the Commission proposed revising legislation and implementing new initiatives as part of the active policy of revitalization of rail transport in the EU.[110] In 2021 the Council adopted conclusions on rail, highlighting the further development and boosting of rail freight and passenger

106 Pencheva, Asenov, Sladkowski, Ivanov, Georgiev, *op. cit*., note 103, p. 64

107 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – Sustainable and Smart Mobility Strategy – putting European transport on track for the future [2020] COM/2020/789 final

108 *Ibid.*

109 *Ibid.*

110 Commission Staff Working Document Evaluation of Regulation (EU) No 913/2010 concerning a European rail network for competitive freight [2021] SWD(2021) 135 final, p. 8

transport competitiveness.[111] Initiatives and measures proposed in the "Fit for 55" package and nominating 2021 The European Year of Rail boost and promote rail compared to other transport modes, especially air transport. As stated, the EU is trying to shift the majority of medium-distance passenger transport to rail[112] by 2050.

Do ambitious Green Deal goals and "Fit for 55" make rail and air transport rivals since the initiative on the EU level proposes the shift from air to rail due to sustainability or should multimodal air-rail transport solutions become complementary to meet the target?

Aviation is one of the industries most hit by the Covid-19 pandemic, and it is one of the industry sectors most affected by the "Fit for 55" legislative proposals.[113] Although it is expected that "Fit for 55" package will transform aviation and transport in general towards net-zero carbon emissions in 2050 and a reduction of 55% greenhouse gas (GHG) emissions by 2030 it will touch aviation from many different angles such as:

- mandated blending of sustainable aviation fuels (SAF)
- ending of free carbon allowances
- adding a new taxes on fossil fuels including jet fuel
- change in Carbon Border Adjust Mechanism (CBAM) that will raise the fuel cost on which airlines rely.[114]

In response to the "Fit for 55" proposals, European Airlines, aerospace manufacturers, and air navigation service providers published the initiative "Destination 2050" as their plan for full decarbonization. It is recognized that the whole European transport ecosystem and decision-makers must act together to reach common goals.[115] After the COVID-19 pandemic and the impact on the aviation

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111 European Council, Building the single European railway area, 2022, [https://www.consilium.europa.eu/en/policies/single-eu-railway-area/], Accessed 8 April 2022

112 Railway and waterborne transport are mentioned as the most environmentally friendly modes of transport, which is why shifting transport to these modes is proposed. "The total environmental costs in the EU-28 of air pollution, climate change, well-to-tank emissions and noise caused by flying are substantially higher (EUR 32.7 billion for a selection of 33 airports) than those caused by rail passenger transport (EUR 7.8 billion)." EEA, Report No 19/2020, Train or plane?, *op. cit.*, note 28, p. 19

113 Adler, K., EC Fit for 55 proposals promise „transformative impact" on aviation, 2021, [https://cleanenergynews.ihsmarkit.com/research-analysis/ec-fit-for-55-proposals-promise-transformative-impact-on-aviat.html], Accessed April 9 2022

114 *Ibid.*

115 Royal Netherlands Aerospace Centre, Destination 2050, A Route to Net Zero European Aviation, 2021, [https://www.destination2050.eu/wp-content/uploads/2021/03/Destination2050_Report.pdf] Accessed April 9 2022

sector, it is more than ever important to revise existing legislation and programs and approach them in a new and better way. On July 14th 2021 a new proposal for a Regulation on ensuring a level playing field for sustainable air transport was presented, highlighting that a uniform and a clear set of EU rules must apply at all EU levels enabling equal opportunities for all airlines and airports.[116] Mandates prescribed in "Fit for 55" under the program named ReFuelEU Aviation Initiative regarding the Sustainable Aviation Fuel are correlated with the aviation industry's interest in using sustainable biofuels and governments must implement constructive policy framework and legislation to avoid "the creation of a patchwork of different measures on the national level."[117]

Due to the European Green Deal goals and promoting rail transport as the most sustainable, there are initiatives and debates that some air routes should be operated by high-speed trains (HSR) instead.[118] According to the available data and analysis, this idea needs to be further discussed and explored from different angles: environmental, economic, and social. It is important to find areas where rail and air are complementary. Compared to rail transport, aviation produces much more GHG emissions, but road[119] transport produces 5 times more than aviation and 140 times more than rail transport. Some authors emphasize that "the introduction of HSR services does not necessarily lead to overall environmental advantages".[120] However, all recent studies and debates on policymaking go toward the air-rail shift. For example, there is an initiative in France to prohibit by national law domestic flights when there is an alternative by train for a trip less than 2 hours and 30 minutes, with the exception only of connecting flights to distant destinations.[121]

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116 Proposal for a Regulation of the European Parliament and of the Council on ensuring a level playing field for sustainable air transport [2021] COM/2021/561 final

117 *Ibid.*

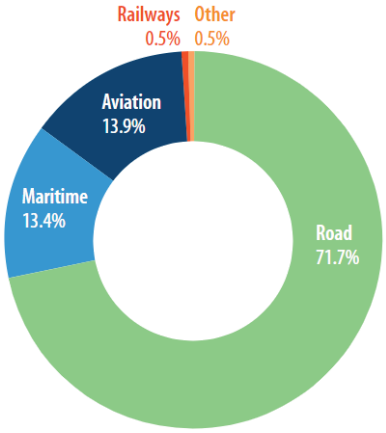
118 Eurocontrol, Think paper #11, *Plane and train: Getting the balance right,* 2021, [https://www.eurocontrol.int/publication/eurocontrol-think-paper-11-plane-and-train-getting-balance-right], Accessed 9 April 2022

119 According to the White Paper of 2011, 30% of freight road transport longer than 300 km needs to be redirected to other modes of transport by 2030, such as rail and water transport; and by 2050 more than 50%

120 D'Alfonso, Jiang, Bracaglia, *op. cit*., note 53, p. 262

121 Ministere de la Transition Ecologique, *Climate and resilience law: ecology in our lives,* 2021, [https://www.ecologie.gouv.fr/loi-climat-resilience], Accessed 9 April 2022

Figure 4. Share of transport GHG emissions in 2018.



Source: Eurocontrol, Think paper #11, 2021, *Plane and train: Getting the balance right,* [https://www.eurocontrol.int/publication/eurocontrol-think-paper-11-plane-and-train-getting-balance-right] Accessed 9 April 2022

The EEA "Train or plane?" report of 2020 shows that a number of studies have tried to identify the impact of high-speed rail on air travel supply and demand in Europe: "while high-speed rail has an impact on the number of seats offered, there is mixed evidence for how this affects the number of flights, which is most relevant from an environmental point of view."[122]

The "plane vs. train "substitution is mainly discussed in the two categories: distances up to 500 km and 500-1000 km. The goal is to substitute short-haul flights with High-Speed Rail (HSR). This would affect 24.1% of European flights, responsible only for 3.8% of aviation gross emissions based on 2019 data.[123] According to the Transport and Environment research "Maximising air to rail journeys", a shift toward the rail transport connecting major European cities with a distance up to 1000 km would reduce only 2-4% of overall EU aviation emissions.[124]

There is also an issue regarding HSR infrastructure. It is indisputable that a big shift to rail requires new infrastructure. The cost of HSR infrastructure is 5 times more than for air transport, and rail infrastructure, in general, is 10 times more damaging to land use "resulting in a total habitat damage cost of € 2.7 billion in

122 EEA, *Report No 19/2020, Train or plane?, op. cit.*, note 28, p. 11

123 Eurocontrol, *op. cit.,* note, 118

124 Transport and Environment, *Maximising air to rail journeys,* 2020, [https://www.transportenvironment.org/wp-content/uploads/2021/07/2020_07_Air2Rail_Briefing_paper.pdf] p. 7, Accessed 10 April 2022

the then-EU 28."[125] When it comes to noise pollution people living in the vicinity of HSR lines are 5 times more affected than those living in the airport area.[126]

Despite the major COVID-19 impact, aviation is still making efforts toward reaching net-zero emissions by investing in new technologies and the use of sustainable aviation fuels. This all comes with a high cost for the aviation sector and airlines in general, so transport investments should be equally balanced to provide the best result.

Some airlines already offer to their passengers Rail & Fly service as an option in combination with the ticket for the international flight.[127] This is the complementary multimodal solution that combines rail and air transport, especially in the areas where road transport is dense and rail infrastructure already exists. Rail simply cannot substitute air in all terms, but multimodal solutions with a balanced and coordinated approach can improve connectivity and enhance sustainability. Rail transport can be compared with air transport only when discussed HSR. However, it is not possible to achieve the goals set by the EU Green Deal especially when the member states have different infrastructures and financial possibilities making it impossible to shift. Also, there is a major difference in funding because airport infrastructure is usually funded by airports themselves, and the cost of HSR infrastructure is paid from public taxes. In this way, HSR is not the practical and fast way to achieve green goals. Sustainable transport means putting users first and ensuring affordable, efficient and cleaner modes of transport, and here multimodal transport can help. However, an easier way to finance multimodal solutions should be developed.

7. CONCLUSION

The development of transport has considerably contributed to the increase of adverse environmental impacts. Also, the impact of pollution on human health is enormous and harmful. However, some modes, like rail and inland waterway transport, are considered more eco-friendly. The European Union's transport policy is focused on sustainable development, and for this purpose, a number of documents, measures, and programs have been adopted.

One of the White Paper "Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system" goals is that most

[125] Eurocontrol, *op. cit.,* note, 118

[126] *Ibid.*

[127] Deutsche Bahn, *The train to your plane,* [https://www.bahn.de/service/buchung/bahn_und_flug/rail-and-fly-english], Accessed 10 April 2022

medium-distance passenger transport should go by rail by 2050. It was stated in the White Paper that "the EU aviation industry should become a frontrunner in the use of low-carbon fuels to reach the 2050 target." In the year 2019 European Commission published the European Green Deal that aims to achieve climate neutrality by 2050. The initiative included in the European Green Deal is "Fit for 55" package adopted in 2021. "Fit for 55" represents EU's target of reducing net greenhouse gas emissions by at least 55% by 2030. The "Fit for 55" package stirs the way of presented green transition through new policies, use of regulations, amendments, and non-legislative communication. As envisioned by the 2011 White paper, a single European transport area still remains the main focus and pillar of European transport policy. In 2021, the EU adopted the European Climate Law (Regulation (EU) 2021/1119), which legally sets the EU's target to become climate-neutral by 2050.

Currently, the demand for traveling is reduced due to the COVID-19 pandemic. The COVID-19 pandemic affected all transport modes so the passenger transport within the European Union member states was partially or completely closed during the worst periods of the pandemic.

In order to achieve the recovery of the transport sector from the COVID-19 pandemic, but also to achieve environmental goals, solidarity between Member States and citizens is needed. As pointed out in the European Green Deal, all Member States need to participate in the costs, but assistance will be provided to those who need it most so that everyone can benefit from the transition. The same can be said for transport - all transport modes will have to contribute to the 55% reduction effort.

As was presented in the paper, the EU is trying to shift the majority of medium-distance passenger transport to rail by 2050. In the ambition is to achieve climate neutrality by 2050 every mode of transport should contribute. Railway and waterborne transport are mentioned as the most environmentally friendly modes of transport, so shifting transport to these modes is proposed. However, caution is needed here as well. Due to the European Green Deal goals, there are initiatives that some air routes should be operated by high-speed trains.

The paper raises the question: Do ambitious Green Deal goals and "Fit for 55" make rail and air transport rivals since the initiative on the EU level proposes the shift from air to rail due to sustainability or should multimodal air-rail transport solutions become complementary to meet the target? This sifting is not an easy or quick, and the problems are predominantly infrastructural. Despite all problems caused by the COVID-19, aviation is still trying to achieve net-zero emissions by

investing in new technologies and using sustainable aviation fuels. However, this causes huge costs for the aviation industry.

A complete shift from air to rail is not likely. In general, the choice between the mode of transport that users choose depends on the specific situation. They certainly take into account the length of the trip, cost, reliability, distance, safety, frequency of the connections, connection with other modes of transport and the like. Rail simply cannot substitute air in all terms in distance regions and islands where connectivity is crucial for economic growth and survival. Finally, this is not even necessary since they can be complementary. Rail and air transport offer multimodal solutions that will benefit both transport users and the environment.

In order to achieve the maximum efficiency of these two modes of transport, which would be part of multimodal transport, certain measures and adjustments will certainly be needed. To achive multimodal transportation major airports need to be connected to the rail network. In addition to infrastructural and technical needs, it will certainly be necessary to adapt legal solutions. For this purpose, it is necessary to investigate the legal regulations of multimodal transport, both passenger and transport of goods. It has already been warned in the paper that regulation of multimodal transportation it is not satisfactory. That will certainly lead to the absence of multimodal transport benefits.

"Fit for 55" package is very ambitious and challenging plan. It will affect all industries and citizens. Especially after the COVID-19 pandemic, it is necessary to revise targets set by the "Fit for 55" packages and to implement measures through RefuelEU that will incentivize the use of sustainable aviation fuels (SAF), considering that SAF is three to five times more expensive than jet fuel. It is necessary to boost the production of SAF because higher production will lower the price and consequently rise the demand. However, there is a justified fear that this will not be easy and quick to implement. We should definitely move away from fossil fuels and turn to alternative and environmentally friendly energy sources. Recent political developments have shown that oil supplies could be cut off quickly. Record oil prices on world markets also support the thesis that it is necessary to look for alternative energy sources. We have already said that this will financially burden the aviation industry, which is still in great losses caused by the COVID-19 pandemic. RefuelEU sets mandatory percentages of SAF that must be mixed with kerosene, which increase over time. Therefore, the opposition of the aviation industry is to be expected, especially since the goals change quickly and often and require huge results in a relatively short period of time. Smaller companies that do not have large funds will be particularly affected. Since alternative fuels should actually be used in all modes of transport, it is necessary to investigate whether

there are enough resources for their production. The European Union has set over-ambitious goals and started complex changes in legislation. Looking at the above problems only in air transport, we think it is not unjustified to ask whether it is possible to achieve carbon neutrality by 2050.

Although the European Commission is optimistic about achieving climate neutrality, we do not share their optimism when it comes to transport. Achieving the goal is challenging for all modes of transport. The future COVID-19 epidemiological situation, which is impossible to predict, political situation and armed conflicts will certainly affect the positive outcome, the amount of available energy sources, and the possibility of adapting certain modes of transport (primarily air). It remains to be seen whether is "Fit for 55" indeed suitable for reducing net-zero emissions target of 55% by 2030.

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