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Review Article

THE POWER OF PAYMENT DIGITALIZATION AS A CONTRIBUTION TO THE DEVELOPMENT OF GREEN ECONOMIES WORLDWIDE

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Abstract: The power of payment digitalization as a contribution to the development of green economies at the global level can be briefly described as twins that cannot survive without each other. The analyses cover key flows of digital technology as support for green economies in the Western Balkans, which we have supplemented with payment digitalization as a factor in the development of green economies

of the European Union, China, and the USA. The key finding is that the power of digitalization in green economies is treated as integrated phenomena towards which digitalized green economies should strive today in the world. The basic priority in the work identified the direction in which the aforementioned economies should move at the global level, primarily the USA, China, and the EU, with particular reference to the economies of the Western Balkan countries and Serbia.

Keywords: *digitalization, green economy, payments, development, cryptocurrencies.*

INTRODUCTION

The green economy and smart financing constitute a set of actions directed towards renewable energy sources through automation and digitalization via projects aimed at enterprises worldwide. Investments in green and sustainable economies and digital solutions play a key role in increasing the competitiveness of domestic companies and their alignment with the European standards of leading economies, whereby such investments bring long-term financial advantages accompanied by rational energy consumption and reduction of greenhouse gas emissions with the so-called greenhouse effect[1]. As a concrete example, paying bills through so-called online payments has positive effects on the environment. According to expert estimates, switching to electronic bills and digital services saves approximately 12,000 trees, 4,500 megawatt-hours of electrical energy, and approximately 51 million liters of water annually, which directly supports the promotion of digital (online) payments and concrete contribution to the development of green economies worldwide [2]. We have deepened this through concrete research in the continuation of the work at the level of Western Balkan countries in comparison with EU economies and the broader region.

Digitalization and the development of modern technologies are particularly important for us in the transition of green economies, whose strong expansion has been present since the end of the last century and the beginning of this century, actually seen as a way to overcome development limitations in terms of threats to sustainable development. Our research focus will further be on the current topic of various financing models, specifically the contribution of digital technologies as support for the development of green transitions of economies in the Western Balkans. This is a very interesting topic that will be processed in the continuation of the work by the very fact that 99% of all enterprises in the Western Balkans in 2025 play a key role in fulfilling the goals of digital and green transition [3].

DIGITAL TECHNOLOGY AS SUPPORT FOR GREEN TRANSITION OF ECONOMIES IN THE WESTERN BALKANS

Financial innovations that characterize the field of environmentally responsible business facilitate the transition to more efficient business operations by enabling easier financing of projects that use available resources more rationally, reduce harmful gas emissions, and promote the use of alternative energy sources - solar, hydro, etc. [4] Finally, the field of green financing creates new jobs and offers the possibility of environmentally conscious business operations. Digital transformation has concretely brought changes to all spheres of life, so it can be freely said that there is no industry it has not affected, from medicine, the oil industry, to telecommunications, media, publishing, and transportation. Digital transformation has brought changes and encouraged not only leaders and large companies but the entire world to think differently [5]. While traditional business is mainly focused on selling products, most modern businesses strategically work on developing digital solutions.

Automation and digitalization encourage productivity, and enterprises that adopt these technologies in the Western Balkans achieve efficiency increases of up to 20 percent [5]. Here we state the fact that many small and medium-sized enterprises in the Western Balkans struggle with adopting digital technologies because the level of digitalization is 20 percentage points significantly lower compared to small and medium-sized enterprises in the EU. Only one-fifth of small and medium-sized enterprises sell online, and less than 10% use innovative digital solutions such as cloud technologies, big data, and AI [6]. To effectively present this, we have the following situation in Table 1:

Table 1. Mobile commerce in the world and in Serbia - e-commerce [10]

Online Commerce Category	Percentage	Projection/Notes
World - mobile commerce	57-60%	Will reach approximately 3/4 of total online sales
Serbia - mobile commerce	>50%	Estimate based on online purchase patterns

From the table, it is clearly visible that online commerce influences the change of consumer payment habits, and thus in the direction of more responsible and sustainable consumption. Its concrete contribution is reflected in reducing the need for physical sales space, more rational inventory management, and optimization of logistics flows, which concretely implies lower consumption of energy and material resources. This is a concrete contribution of mobile commerce through e-commerce payments in favor of the development of green economies.

If we go a step further, the digital revolution and its beginning are mentioned as early as the 1980s of the 20th century, to take the lead in the mid-1990s. Thanks to its ability to improve efficiency and economic competitiveness, generative artificial

intelligence has already found wide application in numerous fields such as banking, healthcare, biology, transportation, higher education, energy, and others[5]. However, besides numerous advantages, generative artificial intelligence simultaneously carries a significant security risk.

The development of green economies in the second half of the 20th century represents one of the key instruments for achieving sustainable development, for protecting and preserving natural resources, for ensuring economic valuation of ecosystem services and goods, reducing poverty, creating opportunities for opening new jobs and decent work, and moving the world in the direction of development with reduced levels of carbon dioxide emissions. A green economy is one in which income and employment growth is created through investments that reduce carbon emissions and/or increase ecosystem efficiency and maintain biodiversity. If we focus on Western Balkan countries, they are generally poor and small (Serbia, Montenegro, Bosnia and Herzegovina, North Macedonia), but with enormous potential for application and development of green economy, sustainable development, and ecological entrepreneurship.

Table 2. Export results within the digital economy - 2023 [11]

Country/Region	**Export Value (million USD)**
Western Balkan countries	12,480
Serbia	8,500
North Macedonia	1,300
Albania	1,100
Bosnia and Herzegovina	518
Montenegro	512

If we summarize investment in digital technology for the development and growth of green economies in the Western Balkans, Serbia leads with exports while other economies in the region lag far behind on this issue [7]. If we further expand our research and compare it with the economies of EU countries and the broader Balkan region, we note differences in the volume of digital services exports that are even more pronounced.

Table 3. Export of digital services - EU countries and broader Western Balkan region - 2023 [11]

Country	Export Value (billion USD)
Austria	35.6
Romania	21.0
Hungary	14.5
Turkey	13.3
Bulgaria	7.7
Greece	6.6
Croatia	4.7
Slovenia	4.3

From the attached data, we can see that these figures indicate that EU countries and the broader region are more viable when it comes to exporting digital services compared to Western Balkan countries. All this indicates that there is a need for accelerated investment in digital skills, infrastructure, and innovations in the region as a contribution to the development of green economies. If we look at the export of digital services of Austria, Romania, and Hungary, there is room for growth towards export-oriented models, broader regional cooperation, and specialization of economies such as Serbia, North Macedonia, and others.

PAYMENT DIGITALIZATION AS A FACTOR IN THE DEVELOPMENT OF GREEN ECONOMIES OF THE EUROPEAN UNION, CHINA, AND THE USA

Pandemics, wars, and accelerated technological changes accompanied by digital impact have shaped markets worldwide, and finally economic interests have influenced the growth and development of green economies worldwide [8]. If we compare the geopolitical rivalry of digital giants the United States and China, the USA strives to maintain a leading position through alliances and digital innovations for the development of green transitions of economies, while China places special emphasis through economic projects and technological investments on the development of green economies, the South China Sea, and influence in Africa and Latin America. These zones of digital interest have changed the technological rulers of digital technologies that once held them through the economy of the European Union and the USA through military power.

Central bank digital currencies are changing the way of payment and investment through concrete impact on green economies [8]. China has already been using the digital yuan since 2020, while the EU and the USA are testing similar projects. Cryptocurrencies, despite volatility, remain part of the financial ecosystem. If we look concretely at cryptocurrencies as green currencies, according to the Deloitte report, by the

end of 2025 they will make 75% of retail planning to accept crypto payments as a new form of contribution to payment digitalization of green economies [6]. Online merchants have adopted cryptocurrencies as a payment method to reduce high banking fees, accepting Bitcoin, Ethereum, and other stable coins.

If we choose the most useful world currency Bitcoin from the aspect of eco-significance and impact on the growth of green economies, its green status can be tracked through the change of energy sources, not technology. Specifically, Bitcoin as the strongest cryptocurrency in the world is the largest individual consumer of green energy. The table below confirms the green dominant status of this cryptocurrency.

Table 4. Share of cryptocurrencies in the global green financial market [9]

Parameter	Value
Renewable energy for Bitcoin mining	52.4%
Annual energy consumption for grid balancing	137 TWh

Note: Energy consumption is still enormous and is approximately equal to the consumption of Argentina [9]

In 2025, the role of digital assets in green economies is multifaceted. The EU uses a regulatory framework for "cleaning up" the cryptocurrency market, China uses blockchain technology, which means using protected databases for cryptocurrencies, and in practice, this would mean using protected transaction ledgers [9]. The Digital Yuan (e-CNY) is designed with centralized control that enables direct programming of "green incentives." A 2025 study confirms the practicality of the green Yuan, enabling more efficient monetary policy directed at green projects, which also represents experience that can serve the economies of the Western Balkans and Serbia, but with privacy risks that are still not present in the EU model [8].

In 2025, the USA has become an economy with a crypto sector that is no longer a "black sheep" of energy transition, but its involuntary partner. Although total energy consumption remains high, the USA and its industry absorb surpluses of renewable energy and reduce methane emissions, which is a tool in the American arsenal of the green economy [8]. A study published in the journal *Energy Economics* (2025) shows that the presence of miners increases the profitability of wind farms in western Texas. Since miners buy surplus electricity at night (when the wind blows, and city consumption is low), they provide a floor price that makes the construction of new wind turbines economically viable without state subsidies. Thus, cryptocurrency mining becomes extremely efficient with a lower floor price that is lower and contributes to greater profitability of the crypto sector [12].

CONCLUSION

Digital technology and green transition of economies are twins, and the facts we reached from the previous part of the work are that the Western Balkans lag in these mentioned segments, which leads not only to technical backwardness but also to economic unsustainability of these economies. On the other hand, the global example of economies within the scope of the titled topic, China and the USA as examples, show that their intensive models of payment digitalization power indicate that there should be a balance between them that requires sophisticated institutional and infrastructural support, and success in the coming years will not depend on adaptation to new technologies, but on the ability of societies to use digital currencies and tools to create economic models that will serve as a model for Western Balkan economies.

REFERENCES

1. Dašić, G., & Anufrijev, A. (2022). Zelena ekonomija kroz prizmu digitalne transformacije. *Ecologica*, 29(107), 331-336. https://doi.org/10.18485/ecologica.2022.29.107.5
2. Janković, I. (2025). Zeleni finansijski instrumenti. In *Zbornik radova SYM-OP-IS 2025: 52. Međunarodni simpozijum o operacionim istraživanjima* (pp. 34-39). FON, Univerzitet u Beogradu.
3. Marjanović, V., & Manasijević, A. (2025). Institucionalne promene, digitalna transformacija i veštačka inteligencija u funkciji razvoja regenerativne ekonomije Republike Srbije. In *Institucionalne promene kao determinanta privrednog razvoja Republike Srbije* (pp. 83-84). Ekonomski fakultet Kragujevac. https://ekfak.kg.ac.rs/images/Nir/InstitucionalnePromene/InstitucionalnePromene2025.pdf
4. Đorić, Ž. (2021). Zelena ekonomija i održivi razvoj u zemljama Zapadnog Balkana. *Ekonomske ideje i praksa*, 41, 69. Ekonomski fakultet, Beograd. https://www.ekof.bg.ac.rs/wp-content/uploads/2014/10/Rad-55.pdf
5. Kovačević, A. (2025). Moguće opasnosti generativne veštačke inteligencije. In *Veštačka inteligencija kao pokretač razvoja nerazvijenih područja: Mogućnosti i perspektive: Zbornik radova SMEPP 2025* (pp. 1-12). Novi Pazar. https://doi.org/10.5281/zenodo.15789824
6. NEURON expert. (2025). Evolucija kriptovaluta: Ključne industrije koje usvajaju digitalne aktive do 2025. godine. https://neuron.expert/news/crypto-adoption-in-2025-business-industries-at-the-forefront-of-the-blockchain-world/11680/sr/
7. World Bank. (2025). Export of digital services statistics. Available at https://eupravozato.mondo.rs/nauka-i-tehnologija/informaticke-tehnologije/a12282/ko-proizvodi-i-izvozi-najvise-digitalnih-usluga-i-prozvoda-na-zapadnom-balkanu.html
8. Aloisi, A. (2025). Integrating the EU Twin (Green and Digital) Transition? Synergies, tensions and pathways for the future of work. *Columbia Journal of European Law*,

30(3). https://cjel.law.columbia.edu/print/2025/integrating-the-eu-twin-green-and-digital-transition-synergies-tensions-and-pathways-for-the-future-of-work/

9. Elad, B., & Lee, R. A. (2025). Bitcoin Energy Consumption Statistics 2025: How much is too much? *SQ Magazine*, 16 October. https://sqmagazine.co.uk/bitcoin-energy-consumption-statistics/
10. Anuraag Jain, 22.05.2025, 2025 Mobile Commerce: Key Statistics and Trends to Follow, E-COMMERCE / MOBILE COMMERCE, Oyelabs, https://oyelabs.com/mobile-commerce-key-statistics-and-trends-to-follow/, Available 29.09.2025
11. Po podacima svetske banke, a preuzeto sa https://eupravozato.mondo.rs/nauka-i-tehnologija/informaticke-tehnologije/a12282/ko-proizvodi-i-izvozi-najvise-digitalnih-usluga-i-prozvoda-na-zapadnom-balkanu.html, Available 27.09.2025
12. Barry Elad, Robert A. Lee, Bitcoin Energy Consumption Statistics 2025: How much is too much?, 16.10.2025, SQ Magazine, https://sqmagazine.co.uk/bitcoin-energy-consumption-statistics/, Available 27.10.2025