



## Green innovations in Georgia and Poland: Comparative Analysis – Selected Issues

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**Abstract.** This article analyses the concept of green innovations. This concept is based on the premise that economic activities should focus on the search for more efficient use of resources. Green innovations are a form of innovation aiming at reducing the negative impact of products and production processes on the environment. The aim of the article is to highlight some of the problematic areas in the way the legal systems of Poland and Georgia treat green innovations. In both analyzed countries, green innovations, are the part of the law that is still forming and its application lacks clarity and consistency. This paper also provides a comparison of the green innovations in Polish and Georgia which allows detection of similar or different solutions in the area of animal protection. The paper also shows the normative solutions in this area. The study of the outlined problems was mainly based on the comparative, dogmatic, and legal method. The article finishes with synthetic conclusions.

**Keywords:** green innovations, eco-innovation, environment, environmental protection, sustainable development.

**JEL Classification:** K20, K32, K33.

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### INTRODUCTORY REMARKS

The responsibility of each human being – to make the world a better place for living and reducing environmental harm, became the stimulus for new creations. Apart from reducing the harm on climate and world, people working on the new solutions and inventions shall also get properly rewarded and their intellectual work shall also be well-acknowledged. Sufficiently protected IP will promote the motivation of the inventors.

The concept of eco-innovation emerged in connection with the increase in environmental problems and the search for a new, more sustainable paradigm of economic development (Szutowski et al., 2017, p. 2). This concept is based on the premise that economic activities should focus on the search for more efficient use of resources. Green innovations are “a specific form of innovation aiming at reducing the impact of products and production processes on the natural environment” (Ozusaglam, 2012, p. 15; Rennings, 2000, p. 319-332). The essence of green innovations is to increase the competitiveness of entrepreneurs who use environmentally friendly technological solutions in their business activities (Popp et al., 2010, p. 873–935). This promotes among entrepreneurs’ activities leading to the implementation of innovative processes, products, services, or solutions that will develop the entrepreneur's economic activity, and at the same time contribute to better waste management, energy efficiency, reduced emissions of pollutants, and efficient material management<sup>1</sup>. Green innovations can be a way of motivating entrepreneurs, investors, and private persons to take actions in the field of environmental protection<sup>2</sup>.

As K. Olejniczak notes, green innovation is connected with the concept of sustainable development (Olejniczak, 2015, p. 56). According to M. Janiszek „actions in favour of the environmental protection are more and more often treated by the enterprises not as the cost but as an investment for future. Amongst the benefits of improvement in the corporate image, a cost-cutting of functioning of the enterprise by reducing the negative influence of the business activity to the environment, a height of the loyalty of customers and stakeholders are being exchanged” (Janiszek, 2018, p. 86). Green innovations reduce the harmful impact of economic processes on the environment. Additionally, they facilitate the productive use of natural resources (Rennings, 2000, p. 319–320). As a result, green innovations take into account the ecological dimension (mitigating the effects of human-induced changes in the environment), the economic dimension (related to cost reduction), and safety issues (reducing dependence on the supply of raw materials) (Romańczyk, 2010).

Despite the interest in the legal doctrine in the indicated issues, there is no detailed study comprehensively discussing the nowadays issues of green innovations. In this respect, the paper will be significant from a theoretical perspective by filling in the gap within the analysed area and by indicating legislative changes that should be introduced. The paper will mainly be based on the analytical method that will encompass sources of law, including normative acts relating to the implementation of green innovations. The analytical research will also encompass the achievements of the doctrine relating to green innovations in the context of economic activity. The purpose of the above will be to demonstrate that the problems that characterize green innovations cause difficulties at the stage of their interpretation and application in Poland and in Georgia.

## GREEN INNOVATIONS – DEFINITIONS, AND TYPES

It is worth noting, that the concept of green innovations inevitably leaves room for a huge variety of interpretations. Another problem is the use of different terminology. In addition to green innovations, the literature uses the following terms to describe this concept: eco-innovation, sustainable innovation, sustainability-driven innovation, green technologies environmental innovations, or environmental technologies (see Ziółkowski, 2008). They apply to goods, services, manufacturing processes, or business models<sup>3</sup>.

The concept of “eco-innovation” first appeared in the literature in 1996 in the book “Driving Eco-Innovation: A Breakthrough Discipline for Innovation and Sustainability” written by Claude Fussler and Peter James (Kowalska, 2014, p. 154). These authors defined eco-innovations as “new products and processes which provide customer and business value, but significantly decrease environmental impacts” (Fussler & James, 1996, p. 364). This concept is

<sup>1</sup> Eco-Innovation and Digitalisation Case studies, environmental and policy lessons from EU Member States for the EU Green Deal and the Circular Economy, EIO Biennial report 2020, [https://ec.europa.eu/environment/ecoap/sites/default/files/eio5\\_eco-innovation\\_and\\_digitalisation\\_nov2020.pdf](https://ec.europa.eu/environment/ecoap/sites/default/files/eio5_eco-innovation_and_digitalisation_nov2020.pdf) (accessed 15.04.2022).

<sup>2</sup> Ibid.

<sup>3</sup> OECD Studies on Environmental Innovation, Better policies to support eco-innovation, OECD Publishing 2011, p. 29.

also understood as “all measures of relevant actors (firms, politicians, unions, associations, churches, private households) which develop new ideas, behaviour, products and processes, apply or introduce them and which contribute to a reduction of environmental burdens or to ecologically specified sustainability targets” (Klemmer et al., 1999, as cited in Carrillo-Hermosilla et al., 2010, p. 1074). According to the European Commission green innovation “is any form of innovation aiming at significant and demonstrable progress towards the goal of sustainable development, through reducing impacts on the environment or achieving a more efficient and responsible use of natural resources, including energy”<sup>4</sup>. In the literature, the green innovations are understood, among others, as “innovations that consist of new or modified processes, practices, systems and products which benefit the environment and so contribute to environmental sustainability” (Oltra & Saint Jean, 2009, p. 567–583). Eco-innovation is also “innovation that reflects the concept’s explicit emphasis on a reduction of environmental impact, whether such an effect is intended or not. And, it is not limited to innovation in products, processes, marketing methods, and organizational methods, but also includes innovation in social and institutional structures” (Kesidou & Demirel, 2012, p. 862).

One of the most frequently cited definitions of eco-innovations is the one proposed by R. Kemp and P. Pearson, according to which the green innovations should be understood as “the production, assimilation or exploitation of a product, production process, service or management or business method that is novel to the organisation (developing or adopting it) and which results, throughout its life cycle, in a reduction of environmental risk, pollution and other negative impacts of resources use (including energy use) compared to relevant alternatives” (Kemp & Pearson, 2008, p. 7). This definition is often considered the most universal in literature.

Science has made many attempts to define the above term. The term “green innovation” or “eco-innovation” is not understood uniformly and is generally treated very broadly (Carrillo-Hermosilla et al., 2010, p. 1073; see Tietze et al., 2011). Summarizing the considerations on the concept of “green innovations”, it should be noted that most of definitions emphasize the new nature of the planned activities as well as the need to consider environmental protection (reducing environmental impacts). What is important green innovation “may be environmentally motivated, but may also occur as a side-effect of other goals, such as complying with regulations and norms, increasing productivity, reducing input costs (and hence production costs)”<sup>5</sup>. R. Kemp, P. Pearson developed a classification of eco-innovation according to which they distinguished: “environmental technologies” (for example pollution control technologies including wastewater; waste management equipment; environmental monitoring and instrumentation; noise and vibration control etc.), „organisational organisations” (for example: pollution prevention schemes, environmental management, and auditing systems or chain management), „product and services innovations” (for example green financial products such as eco-leases or climate mortgages) or „green system innovations” (for example biological agriculture and a renewables-based energy system) (Kemp & Pearson, 2008, p. 10-11). M.M. Anderson, on the other hand, divides eco innovation into „add-on eco-innovations”, „integrated eco-innovations”, „alternative product eco-innovations”, „macro-organizational eco-innovations” or „general purpose eco-innovations” (Andersen, 2002, p. 103-119, as cited in Olejniczak, 2015, p. 57-58). A. Triguero, L. Moreno-Mondéjar, M.A. Davia indicate three types of eco-innovation “eco-innovative product or service to the market” (*ecoproduct*), “eco-innovative production process or method” (*ecoprocess*) and “eco-innovative organizational innovation” (*ecoorganize*) (Triguero et al., 2013, p. 28).

<sup>4</sup> European Commission (2013), p. 3.

<sup>5</sup> OECD, Sustainable manufacturing and eco-innovation, Framework, Practices and Measurement, Synthesis report, Paris 2009, as cited in: S. Ozusaglam (2012, p. 18).

## GREEN INNOVATIONS IN POLAND

Green innovation is an issue that is related to intellectual property law on the one hand, and environmental law on the other. Intellectual property<sup>6</sup> law is regulated in Poland by both international and national law and is also subject to EU legislation. In the field of intellectual property law, Poland is additionally a member of WIPO<sup>7</sup>. The environment in the European Union is a shared competence. This means that both the EU and EU Member States can legislate and adopt binding legal acts in the field of environmental protection (Zapolska, 2020, p. 23-24). As a result, environmental law in Poland has been adapted to the requirements of EU law.

According to the EU “research and innovation, including eco-innovation and social innovation, are among the main drivers of future growth and have been put at the centre of the Europe 2020 strategy for smart, sustainable and inclusive growth”<sup>8</sup>. An eco-innovation is “any innovation that makes progress towards the goal of sustainable development by reducing impacts on the environment, increasing resilience to environmental pressures or using natural resources more efficiently and responsibly”<sup>9</sup>. Green innovations are therefore significant not only to the economic competitiveness of Europe but also environmental protection, business and future well-being<sup>10</sup>. Eco-innovations and green technologies are considered to be “the heart of the European Union’s policies”<sup>11</sup>.

In recent years, there has been an increase in the importance of environmental issues in the EU. Regulations and strategies connected with environmental protection are numerous and scattered among many laws and regulations. What is more, new rules are still being introduced. In terms of green innovations, it is worth mentioning the 7<sup>th</sup> Environment Action Programme (7EAP)<sup>12</sup> that include Europe 2020 strategy (COM (2010) 2020), the Union climate and energy package<sup>13</sup>, the Commission Communication on a Roadmap for moving to a low-carbon economy in 2050<sup>14</sup>, the EU Biodiversity Strategy to 2020 (COM (2011) 244), the Roadmap to a Resource Efficient Europe (COM (2011) 571), the Innovation Union Flagship Initiative (COM (2010) 546) and the European Union Strategy for Sustainable Development.

Over the last year, the EU has adopted many environmental documents and strategies that are directly or indirectly related to green innovation. In this regard, it is necessary to mention, inter alia, The European Green

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<sup>6</sup> Hereinafter as “IP”.

<sup>7</sup> Poland joined WIPO in 1975.

<sup>8</sup> Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC (OJ L 94, 28.3.2014, p. 65–242).

<sup>9</sup> Decision No 1639/2006/EC establishing a Competitiveness and Innovation Framework Programme.

<sup>10</sup> European Commission (2013).

<sup>11</sup> European Commission (2013).

<sup>12</sup> Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 ‘Living well, within the limits of our planet’ (OJ L 354, 28.12.2013, p. 171–200). The program emphasizes that there is significant scope for reducing GHG emissions and enhancing energy and resource efficiency in the Union. It also set out a vision of “living well within the limits of the planet”, including the need to “turn the Union into a resource-efficient, green, and competitive low-carbon economy”, by 2050.

<sup>13</sup> Regulation (EC) No 443/2009 of the European Parliament and of the Council of 23 April 2009 setting emission performance standards for new passenger cars as part of the Community’s integrated approach to reduce CO<sub>2</sub> emissions from light-duty vehicles (OJ L 140, 5.6.2009, p. 1), Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (OJ L 140, 5.6.2009, p. 16), Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community (OJ L 140, 5.6.2009, p. 63), Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC (OJ L 140, 5.6.2009, p. 88), Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No 1013/2006 (OJ L 140, 5.6.2009, p. 114), Decision No 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community’s greenhouse gas emission reduction commitments up to 2020 (OJ L 140, 5.6.2009, p. 136).

<sup>14</sup> COM (2011) 112. The Roadmap was noted by the Council in its Conclusions of 17 May 2011 and was endorsed by the European Parliament in its Resolution of 15 March 2012 (P7\_TA (2012)0086).

Deal<sup>15</sup>, The Recovery Plan for Europe<sup>16</sup>, EU strategy on offshore renewable energy<sup>17</sup>, The European Climate Pact<sup>18</sup>, The European Battery Alliance (EBA)<sup>19</sup>, The New European Bauhaus, Zero pollution Action Plan<sup>20</sup>, Organic Action Plan<sup>21</sup>, Sustainable blue economy<sup>22</sup> and New EU strategy on adaptation to climate change<sup>23</sup>. In addition, on 14 October 2020 European Commission presents proposal for the 8th Environment Action Programme<sup>24</sup>, which aims to accelerate the transition to a climate-neutral, resource-efficient and regenerative economy.

Important elements of the European policy framework for sustainable consumption and production are the Environmental Technologies Action Plan (ETAP)<sup>25</sup>, the Eco-Management and Audit Scheme (EMAS), the EU Ecolabel, the Environmental Technology Verification (ETV) scheme, the European Business Awards for the Environment (EBAE), Enterprise Europe Network (EEN), Green Action Plan for SMEs and the Product Environmental Footprint pilot.

On the one hand, such frequent and numerous changes in the EU law related to green innovations are understandable and necessary, because they result from the constantly growing knowledge and awareness of environmental protection. On the other hand, they create a very extensive and complex set of standards for green innovation. Their number may make it difficult to get to know them properly and comprehensively, and then to put them into practice. It is worth remembering that EU Member States (including Poland) are obliged to ensure the effectiveness of EU law, including environmental protection regulations (Zapolska, 2020, p. 149.). Most regulations in the field of environmental protection law are adopted at the EU level and then introduced by the Member States<sup>26</sup>. As a consequence, Poland has a very extensive legal system of environmental protection. Thus, the activities of the EU have a significant impact on the Polish understanding of environmental protection and green innovations.

In Poland, the specification of activities increasing eco-innovation can be found in the 2030 National Environmental Policy – the Development Strategy in the Area of the Environment and Water Management<sup>27</sup>. Goals indicated in PEP2030 should help to invest European funds in 2021-2027 and to achieve Poland's international targets and commitments such as the UN Sustainable Development Goals, or the Paris Climate Agreement<sup>28</sup>. This document is strategic documents that specify The Responsible development Strategy until 2020 (with an Outlook

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<sup>15</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. The European Green Deal (COM/2019/640). The Green Deal will make “consistent use of all policy levers: regulation and standardisation, investment and innovation, national reforms, dialogue with social partners and international cooperation. It also should foster the deployment of innovative technologies and infrastructure, such as smart grids, hydrogen networks or carbon capture, storage and utilisation, energy storage, also enabling sector integration”.

<sup>16</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Europe's moment: Repair and Prepare for the Next Generation (COM (2020) 456).

<sup>17</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. An EU Strategy to harness the potential of offshore renewable energy for a climate neutral future (COM/2020/741).

<sup>18</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. European Climate Pact (COM/2020/788).

<sup>19</sup> Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL concerning batteries and waste batteries, repealing Directive 2006/66/EC and amending Regulation (EU) No 2019/1020.

<sup>20</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Pathway to a Healthy Planet for All EU Action Plan: “Towards Zero Pollution for Air, Water and Soil” (COM/2021/400). The revision “aims to accelerate the uptake of zero-pollution innovation”.

<sup>21</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on an action plan for the development of organic production (COM/2021/141). According to Organic Action Plan the Commission “intends to increase the share of research and innovation (R&I) and dedicate at least 30% of the budget for research and innovation actions in the field of agriculture, forestry and rural areas to topics specific to or relevant for the organic sector”.

<sup>22</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a new approach for a sustainable blue economy in the EU Transforming the EU's Blue Economy for a Sustainable Future (COM/2021/240). The blue economy of the European Union emphasizes “the need to steer the EU on a more sustainable path, it will become a font of action and ideas creating innovation, spurring fast and lasting recovery and protecting our planet”.

<sup>23</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change (COM/2021/82). The Commission will, in the context of the Renewed Sustainable Finance Strategy, inter alia, “explore the wider use of financial instruments and innovative solutions to deal with climate-induced risks”.

<sup>24</sup> Proposal for a Decision of The European Parliament and of the Council on a General Union Environment Action Programme to 2030 (COM (2020) 652).

<sup>25</sup> Communication from the Commission to the Council and the European Parliament - Stimulating Technologies for Sustainable Development: An Environmental Technologies Action Plan for the European Union (COM/2004/0038).

<sup>26</sup> Ibid.

<sup>27</sup> Hereafter as PEP2030

<sup>28</sup> Information brochure. The 2030 National Environmental Policy, Warsaw 2019, p. 3,

[https://bip.mos.gov.pl/fileadmin/user\\_upload/bip/strategie\\_plany\\_programy/Polityka\\_Ekologiczna\\_Panstwa/200528\\_broszura\\_PEP\\_ENG.pdf](https://bip.mos.gov.pl/fileadmin/user_upload/bip/strategie_plany_programy/Polityka_Ekologiczna_Panstwa/200528_broszura_PEP_ENG.pdf) (accessed 16.03.2022).

until 2030)<sup>29</sup>. One of the main tasks of this document is to support the implementation of eco-innovation and the dissemination of the best available techniques (BAT).

According to PEP2030 “eco-innovations play a particularly important role in stimulating the process of transition to a circular economy, the prevention of climate change and biodiversity loss, the protection of air quality or the sustainable use of water resources and ensuring their good quality. At the same time, they contribute to enhancing competitiveness and economic development as well as to strengthening the resilience of the economy to environmental pressures, improving the efficiency of using natural resources and reducing the adverse human impact on the environment. A change of the production and consumption patterns to more resource and energy efficient adaptation actions and the transformation of waste into products with a high added value will require new technologies, processes and services”<sup>30</sup>. In light of the above, the PEP2030 in this matter underline the need to<sup>31</sup>:

- financial support for entrepreneurs and providing advice on eco-innovation in order to reduce their impact on the environment.
- financing research, development and implementation projects related to innovative environmental technologies.
- supporting the export of Polish green technologies.

PEP2030 emphasizes the need to promote and support the implementation of innovative environmental technologies and to build a coherent, systemic approach supporting the development and implementation of innovations in Poland<sup>32</sup>. The coordinator of strategy is the Minister of climate. The concept of green innovations can also be found in the objectives of the Strategy for Innovation and Efficiency of the Economy “Dynamic Poland 2020”.

According to “Innovation activities of enterprises in the years 2017-2019” prepared by Statistics Poland<sup>33</sup>, in the years 2017-2019 the innovative activity was demonstrated by 21.7% of industrial enterprise and 13,7% of service enterprises<sup>34</sup>. The number of people working in research and development also increased<sup>35</sup>. At this point it should be mentioned that in recent years two acts have introduced some facilitation in the field of innovation, including green innovations – the Act of 9 November 2017 on amending certain acts to improve the legal environment of innovative activity (Dz. U. of 2017 item 2201), and the Act of 4 November 2016 on amending certain acts specifying the conditions for conducting innovative activities (Dz. U. of 2016 item 2260). The essence of those acts is to remove barriers related to innovative activity and to create effective mechanisms of supporting (e.g. through the tax system) innovative solutions in practice. However, there is still no legal act that would regulate the issue of green innovations comprehensively.

In Poland, entrepreneurs can obtain support in financing ecological investments from both – national institutions and the European Union. Additionally, various instruments are used to encourage investments in environmental protection, e.g. grants and subsidies, credits and loans granted on preferential terms or with low interest rates, the guaranteed purchase price of energy from renewable sources, green certificates, tax breaks and tax exemptions (Burzyńska & Hajdys, 2021, p. 78-79). The national funds include financing granted, for example, by regional development agencies, Bank Ochrony Środowiska SA, Bank Gospodarstwa Krajowego and the National Fund for Environmental Protection and Water Management (LIFE program) (Burzyńska & Hajdys, 2021, p. 79). In terms of foreign funds, a significant role in the field of green innovations was played by the Operational Program Infrastructure and Environment 2014-202, Horyzont 2020, Competitiveness and Innovation Framework

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<sup>29</sup> Hereafter as SOR.

<sup>30</sup> PEP2030, p. 22.

<sup>31</sup> Information brochure. The 2030 National Environmental Policy, p. 9.

<sup>32</sup> PEP2030, p. 14.

<sup>33</sup> Formerly known in English as the Central Statistical Office (pl. Główny Urząd Statystyczny, or GUS).

<sup>34</sup> Innovation activities of enterprises in the years 2017-2019, p. 20.

<sup>35</sup> Ibid.

Programme, SET Plan, INTERREG Europa 2014-2020 and The Polish Sustainable Financing Facility (PolSEFF), that as initiated by the European Bank for Reconstruction and Development (EBRD) supported by the EU (Zabawa, 2013, p. 97-99.).

In addition, among the national instruments of supporting eco-innovation, one should distinguish GreenEvo – Green Technologies Accelerator (AZT), the GEKON program, the EUREKA initiative, two strategic programs of the National Center for Research and Development in the field of sustainable energy generation and use (“Advanced technologies for obtaining energy” and “Integrated system for reducing the operational energy consumption of buildings”), or the activities of Polish Agency for Enterprise Development (PARP) (see Szulczewska-Remi & Foltynowicz, 2016, p. 185-202).

As an example for green innovations in Poland, it is worth mention Prognosis’s remote energy meter reading system uses wireless technology to provide customers with up-to-date, exhaustive data from their meters in the form of easy-to-read charts and reports<sup>36</sup>, Green-Effective Performance Calculator™, or Financial instrument for circularity: ING Bank Slaski. Another eco-innovations are provided by Seedia sp. z o.o. – for example: smart ecological furniture that is powered by renewable energy (solar benches), Solar Hand Sanitizer with InfoKiosk, SEEDiA bus stops/shelters or Universal electromobility charging stations for the Smart City (E-scooter charger)<sup>37</sup>. We should also mention BIOMOTIVE project<sup>38</sup> or the BIOPEN project<sup>39</sup>.

Despite the many funding opportunities, R&D investment in eco-innovation is still relatively low. The problem of the financial gap is a serious barrier to the development of eco-innovation of Polish entrepreneurs (see: Zarębska et al., 2019, p. 245-256; Zarębska & Michalska, 2016, p. 49-64). This is especially noticeable of Poland’s position in innovation rankings. The level of eco-innovation at Polish undertakings is still insufficient<sup>40</sup>. According to European Eco-Innovation Scoreboard, Poland in 2020 took 26th position (out of 27 EU member states). The indicators in the Eco-Innovation Scoreboard include eco-innovation inputs, eco-innovation actions, eco-innovation outputs, eco-innovation socio-economic outcomes, and eco innovation resource efficiency outcomes.

In Global *Cleantech Innovation Index 2017*, prepared in partnership with World Wildlife Fund for Nature (WWF), United Nations Industrial Development Organisation (UNIDO), Asian Development Bank (ADB), Swedish Energy Agency (SEA), and Tillväxtverket, Poland took 24th place (on 40 countries)<sup>41</sup>. GCII explores where and why entrepreneurial clean technology companies are most likely to emerge from over the next 10 years<sup>42</sup>. The index explores the Cleantech innovation system through *inputs to innovation* and *outputs of innovation*. Considering the economic potential of Poland, this is not the best position, but it should be emphasized, that Poland has displayed the biggest change from the 2014 Index<sup>43</sup>. Poland improved score in the Renewable Energy Country Attractiveness Index and public cleantech R&D expenditure. J. Ozdoba emphasizes that “Poland’s poor results in terms of eco-innovation may result from the country’s generally weak innovative position and low expenditure on R&D”, the lack of cooperation between science and industry, as well as “the lack of an integrated support system for eco-

<sup>36</sup> Wireless technology for remote energy meter reading system, [https://ec.europa.eu/regional\\_policy/en/projects/poland/innovative-polish-software-optimises-energymanagement](https://ec.europa.eu/regional_policy/en/projects/poland/innovative-polish-software-optimises-energymanagement) (accessed 15.04.2022).

<sup>37</sup> <https://seedia.city>.

<sup>38</sup> <https://www.bbi-europe.eu/projects/biomotive>.

<sup>39</sup> <https://bbi-europe.eu/projects/biopen>.

<sup>40</sup> The „Regional development of Poland – analytical report 2020” emphasizes that there are also some positive changes in environmental protection – a systematic decrease in emission of pollutants from plants of significant nuisance to air quality (for particulates pollutants it amounted to 56.7%, and for gases pollutants – 8.2%), the average water consumption per capita has decreased (from 268.9 m<sup>3</sup> in 2010 to 229.7 m<sup>3</sup> in 2019), the share of untreated sewage has decreased (from 7.6% to 4.9%). Since 2010, an increase in the amount of municipal waste generated during the year has been observed (by 27.0%), but with a visible constant upward trend in the share of waste collected selectively (by 22.6 percentage points to 31.2%), Statistic Poland, Regional development of Poland – analytical report 2020, Warsaw 2020, p. 13.

<sup>41</sup> The most recent Index and accompanying report were released in 2017, <https://www.cleantech.com/indexes/the-global-cleantech-innovation-index/>.

<sup>42</sup> Ibid.

<sup>43</sup> In the 2020 edition of the Global Innovation Index (GII) Poland ranks among the 131 economies featured in the GII 2020. Is lower than in 2019 and the same compared to 2018. GII ranks countries according to their innovation capabilities. Georgia ranks 63rd place. Georgia performs better in innovation inputs than innovation outputs in 2020. On the other hand on 3 February 2021, Bloomberg published its annual Bloomberg Innovation Index. Poland scored a total of 73.38 points out of the possible 100 in the latest Bloomberg Innovation Index (ranking 23rd position out of 111 countries). This report includes such indicators as for example research and development expenditure, manufacturing capability or concentration of high-tech public companies, productivity or patent activity etc. Poland advanced by two places since 2020 ranking (<https://www.bloomberg.com/news/articles/2021-02-03/south-korea-leads-world-in-innovation-u-s-drops-out-of-top-10>).



innovation” (Ozdoba, 2015, p. 157). The authors of the report prepared as part of the Eco-innovation Observatory, also emphasize the large role of economic barriers, e.g. “high cost of implementation, difficult access to capital, uncertain return on investment and the weak system of economic and fiscal incentives encouraging eco-innovation resulting in reluctance of companies to develop eco-innovative technologies” (Mitsio, 2018-2019, p. 3).

What is more, the lack of a single legal act regulating the issue of green innovations in a comprehensive manner certainly complicates the interpretation and application of this part of the law. However, it should be emphasized that in the discussed case the fragmentation of regulations is not the main source of difficulties, one of the main causes of the problems is the fact that the regulations shaping the sphere of green innovations are not transparent, unambiguous and sufficiently precise. They operate on a diverse conceptual grid and are not terminologically coherent and use expressions and phrases of undefined meaning. The regulations use general clauses and vague terms (for example “a significant negative impact”, “resource-efficient solutions” or “*impacts on the environment*” etc.). As a result, vague and imprecise regulations may be interpreted on a discretionary basis. Consequently, the indicated regulations are interpreted differently and discretionally.

## GREEN INNOVATIONS IN GEORGIA

After the dissolution of Soviet Union, Georgia became a sovereign state and began striving for the transformation to a democratic country, which definitely comprised legal reformation. Georgia joined WIPO in 1991. The laws regulating Intellectual Property was adopted in 1999, but the level of protection of IP was very low, which was naturally caused by the economic and political situation of the country at that time. The desire of becoming developed country with the strong legal and economic environment and a part of European family, drove the country to the inevitable changes. The landmark of the progression was the negotiations on AA agreement, launched in 2010. However, in order to become ready for DCFTA negotiations, Georgia should have accomplished additional works, as regards practical implementation of reforms<sup>44</sup>. The recommendations from EU was a significant signal for the Government of Georgia to implement more effective measures in regards of protection IP rights. At the same year, by the edict of the President of Georgia (N912) Interagency Council for certain IP rights was established and active steps forward to the development of IP has been planned.

Since then the reformation took active phase and comparing to year 2010 the awareness and the IP protection level is significantly increased. Currently, Georgia is a developing country that reveals aspiration towards European values and legal system. Despite that Georgia is aligned with international standards in Intellectual Property law and has an outstanding results for the past 10 years, it should still carry out a numerous legal as well as economic and cultural reforms in order to lay boundaries to a country where intellectual property will be maximally protected.

Nowadays, the climate change became a significant challenge for the world and for each person as well. We all feel the alteration and impact of it on our everyday life. Such changes became the reason and motivation for the inventors to create innovative products for the green world, it took companies to take a social responsibility and create projects, which is aimed for green future. Thus, the changes in the world showed an importance of creation new inventions which reduces the reflection on the earth and environment. But Georgia is not yet enriched with a lot number of green inventions protected by IP Law.

Georgian Legal systems regulates the following fields of IP: Trademark (Law of Georgia on Trademarks), Copyright and neighbouring rights (Law of Georgia on Copyright and Related Rights), Design (Law of Georgia on Design), Patents and Utility Models (Patent Law of Georgia), Geographical Indications (Law of Georgia on

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<sup>44</sup> Implementation of the European Neighborhood Policy in 2010, Country report: Georgia, European Commission, Brussels, 25.5.2011, SEC (2011) 649 final.



Geographical Indications) and New Varieties and Breeds (Law of Georgia on New Breeds of Animals and Varieties of Plant). Every field has its role in creation of green and eco-friendly world. Each solution, might become the subject of either regulation, e.g. the name of the innovation can be protected under the trademark law, the design can be protected either with copyright or design law, the invention itself shall become the subject of the patent, herewith in case the innovation is related to the new varieties and breeds it can become the subject of varieties and breeds. Noteworthy, that Georgian IP legal system does not compile specific regulations, or regime related to green innovation and it is governed under the laws mentioned above.

When analyzing the issue of green innovations in Georgia, one should mention the intellectual property law in Georgia. While assessing the innovation Copyright shall also be assessed. According to article 5 of Law of Georgia on Copyrights (“LOC”), copyright applies to scientific, literary and artistic works that are fixed in tangible form and is a result of intellectual and creative activities and does not apply to ideas, methods, processes, systems, concepts, principles, facts or discoveries. Most commonly, copyright in inventions can be presented as a Software. LOC unifies computer program under the literary work and defines it “as a set of instructions expressed in words, codes, chips or in any other machine-readable form, which enables a computer to achieve certain results. The term also includes preparatory material for a computer program design under the LOC copyright Law as a Literary work, as it appears” (Article 4, par. ”j”) of LOC). This implies that the method, process, principle, concept or idea of invention might not be protected under the copyright, but the instructions of the computer program expressed in words – unique source code, that allows application to run on the platform can be protected under the Copyright. Copyright on the source code protects unauthorized copying of the works of authorship, but it does not mean that third party can’t create the application based on the similar concept. Pursuant to article 6, par. 4 of the LOC, Protection of computer programs shall apply to all kinds of computer programs (including operational systems), which may be expressed in any language and in any form, including the initial text and objective code<sup>45</sup>. Rights on source code appears one of the most important part of the computer program, as the alterations in it can be done through source code and owner is eligible to control internal interface through Source code. Despite the fact, that protection of Copyright depends on the relevant jurisdiction, minimum requirement of the international protection might be determined.

Among 195 countries, since 1995, Georgia is a part of the Berne Convention for the Protection of Literary and Artistic Works<sup>46</sup>. Berne Convention determines minimum protection standards of the copyright in the signatory countries. One of the basic principles are following: Copyright protection must not be conditional upon compliance with any formality, which means that protection does not depend on compliance with any formalities such as registration or deposit of copies and Works originating in one of the contracting party must be given same protection in each of contracting parties, as the latter grants to the works of its own nationals (article 5 of Berne Convention). Therefore, according to the Berne convention, owner of copyright shall enjoy copyright in the signatory countries, but prior search of relevant market is preferable. There is no legally binding minimum fee for the transfer of copyright. LOC requires the written form of the transfer of copyright (articles 36-42 of LOC). The owner of the copyright, is entitled to grant either local or international licenses<sup>47</sup>.

Together with the Copyright, trademark appears the significant assets of the company in regards to the protection of innovations. Trademark is used as a communication tool between the business and the consumer. The article 3 of the Law of Georgia on Trademarks<sup>48</sup> states that a trademark is a sign or any combination thereof represented graphically, that is capable of distinguishing the goods and/or services of one company from those of

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<sup>45</sup> Object code is the source code written for the machinery readable language.

<sup>46</sup> Berne Convention for the Protection of Literary and Artistic Works of September 9, 1886, hereinafter – the “Berne Convention”.

<sup>47</sup> License can be exclusive or conventional. Usually, as a minimum requirement, Copyright license agreement shall contain an exact description of the work to be used (title, size, genre), the specific form of the use of the work, the validity of the term and the territory covered by the agreement, also, the procedure for determining the amount of royalties or the amount of royalties. The requirements might vary based on the jurisdiction of the designated country. Acquiring copyright, does not need to meet any formality. Nevertheless, deposition of source code is preferable by the LOC.

<sup>48</sup> Law of Georgia No. 1795-IIS of February 5, 1999, on Trademarks, hereinafter – the “LGT”.

another. A sign may be a word or words, including personal names, letters, numerals, sounds, images, 3D figures, including shapes of goods or of their packaging, as well as any other decorations of goods using color or any combination thereof. Hence, the name, logo or slogan of the invention can be protected as a trademark. Registration of trademark prevents from the illegal use of the name or logo, or create a confusing name or logo, which may affect the reputation of the company. Contrasting from the copyright, trademark rights in Georgia arise through the registration (except well-known marks, which are protected without the registration and is recognized by the Chamber of Appeals of Sakpatenti or by a court). Trademarks shall be registered under the requirements of Trademark Law of Georgia.

The registration of the trademark, attributes the owner the privileges to assign the rights derived from the registration of trademarks to third parties. Per provided background information, after the registration of the trademarks, owner will be able to assign its rights to the new entity. Assignment shall be concluded in written form, with or without the enterprise, for full or limited lists of the goods. Unlike the copyright license, assignment of the trademark rights shall be registered at Sakpatenti (article 25 of the Trademark Law of Georgia).

Madrid Protocol Treaty for the international registrations of trademarks (27.06.1989) enables member countries of Madrid protocol treaty to make international registrations. As Georgia is a member of the treaty, an entity may acquire international trademark rights through the Madrid Protocol System. The owner of the TM shall prior adjust the designation country and file the international application through Sakpatenti, which is able to make international registrations.

Before granting international licenses, registration of IP asset in the designated country is required. Determine other requirements of the international licensing is not applicable, since the license agreement shall be concluded between two parties and it is the subject matter of future negotiations, there is no legally binding terms based on trademark law of Georgia, unless it is concluded by written form and considers the tm, the duration and extent of license.

Typically, patents are more related to inventions, rather than software items. Hence, invention may contain the software-related inventions, which might be a subject matter of patentability either as an invention or as a utility model.

According to article 12 of the Patent Law of Georgia<sup>49</sup> an invention is patentable if it satisfies the criteria of patentability – novelty, inventive step and industrial applicability. As of the definition from the law, an invention has novelty if it is not known from the existing state of the art and invention involves an inventive step if by the priority date it is not obvious from the state of the art. Industrial applicability of the invention is available, if it is possible to produce or use in the industry or agriculture. Another asset, protected under the Patent law is utility model, which is characterized as a less inventive step compared to invention and is patentable in case of it satisfies novelty, inventive step and industrial applicability (article 71<sup>1</sup> of Patent Law of Georgia).

Patent law of Georgia determines, that an algorithm or computer program shall not be considered as an invention, but only in the case when it directly represents the subject of the patent application. In other words, computer program as an invention itself as a whole cannot be patented, but it may contain inventions or/and utility models which can be protected with the Patent. Finding out whether the invention contains the patentability invention or utility model is assessed, determined and examined by the patent examiner, qualified with relevant technical knowledge.

Unlike the Copyright, patent rights arise only after the registration and is valid only in the granted jurisdiction. Georgia is a member of the Patent Cooperation Treaty<sup>50</sup>, which enables to file an international application in the designated member country through Sakpatenti. Pursuant to the described business model, if creation includes

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<sup>49</sup> Patent Law of Georgia No 3031 of 4 May 2010, hereafter as Patent law of Georgia.

<sup>50</sup> Patent Cooperation Treaty (PCT), Done at Washington on June 19, 1970.

invention or utility model, which satisfies the requirements of patentability, owner will acquire patent rights on the invention. Transfer of the rights shall be concluded in writing and applicable amendments shall be registered at Sakpatenti (article 60<sup>1</sup> of Patent Law of Georgia.). Before granting international licenses, registration of the IP asset in the designated country is required. Determine other requirements of the international licensing is not applicable, since the license agreement shall be concluded between two parties and it is the subject matter of future negotiations. Protection of the appearance, external view of the product is protected by Design. The article 3 of the Law of Georgia on Designs<sup>51</sup> specifies protection criteria of a design as the appearance of the whole product or its part resulting from the features of the product proper, including lines, contours, colours, shape, texture and/or material or decoration of the product. Design is eligible for protection if it has novelty and individual character. Alongside, as a product is considered any industrial or handmade item, including packaging, get-up, graphical symbol, printing type, component part intended to be incorporated into a complex product. Design can be registered at Georgian Intellectual Property Center – Sakpatenti and the application is examined by the expert, which detects whether the design satisfies the criteria of registration.

When analyzing the issue of green innovations in Georgia, it should be mentioned that the most common in Georgia is the invention, solution which enables to use of renewable energy. It is important to have inventions that promise an eco-friendly alternative to users. One of amongst others in Georgia is “Wind belt installation with self-installing between belt blades”<sup>52</sup>. A wind turbine with inter-belt self-adjusting wings designed to convert wind flow energy into shaft torque energy, which is then used as the type of energy required by the user. According to inventor, the invention has a number of advantages over similar devices. First of all, its production is much cheaper than traditional windmills. The second major plus is that due to its shape and functions, it is possible to either raise or lower its height and tension due to the strength of the wind, which allows inventor to obtain the maximum coefficient of rotation. Wind always blows in nature, so converting it into energy is an ecologically justified solution. Such a device will help reduce the need for hydropower plants and create a green future so that the world can switch to more alternative energy in the future.

Georgian Intellectual Property Center has also issued the patent for the method which enables clearing the water. Mainly, the method is for purifying polluted dichlorodiphenyltrichloroet hane (DDT) waters by usage of blue-green algae spirulin<sup>53</sup>. DDT is one of the most harmful pesticides, which has a high amount of toxic and it remains in the environment approximately for 12 years. In human beings, it causes numerous heavy diseases. With this invention, the water will be purified and the harm of the DDT will be significantly reduced for the environment and for human beings as well.

One of the designers has registered the design of the polyethylene ecological packet, which at the time of registration (2010) was created with individual and innovative design, which also was less harmful for the environment<sup>54</sup>. Another example of green innovations is “Aicar”<sup>55</sup>, which is the registered trademark of one of the successful business in Georgia, which enables renting only eco-friendly cars. The solution is helping Georgia to become green and healthy and saves the environment.

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<sup>51</sup> Law of Georgia No. 3030 of May 4, 2010, on Design, hereafter as Law of Georgia on Designs.

<sup>52</sup> Patent Wind Belt Installation With Self-Installing Between Belt Blades, [https://www.sakpatenti.gov.ge/en/search\\_engine/view/13132/1/?fbclid=IwAR2RA5Fwj8Kw09karsTstxtEjgynrhqsJS3Zss-nDHxOWfbcQJxtPvdkiE](https://www.sakpatenti.gov.ge/en/search_engine/view/13132/1/?fbclid=IwAR2RA5Fwj8Kw09karsTstxtEjgynrhqsJS3Zss-nDHxOWfbcQJxtPvdkiE) (accessed 17.05.2022).

<sup>53</sup> Patent Method for Purifying Polluted Dichlorodiphenyltrichloroet Hane (Ddt) Waters by usage ff Blue-Green Algae Spirulin, [https://www.sakpatenti.gov.ge/en/search\\_engine/view/14896/2/](https://www.sakpatenti.gov.ge/en/search_engine/view/14896/2/) (accessed 17.05.2022).

<sup>54</sup> Design Polyethylene Ecological Packet, [https://www.sakpatenti.gov.ge/en/search\\_engine/view/627/4/](https://www.sakpatenti.gov.ge/en/search_engine/view/627/4/) (accessed 17.05.2022).

<sup>55</sup> Trademark LTD “KARTLICAR”, [https://www.sakpatenti.gov.ge/en/search\\_engine/view/101648/3/](https://www.sakpatenti.gov.ge/en/search_engine/view/101648/3/) (accessed 17.05.2022).

## CLOSING REMARKS

Summing up, Poland and Georgia perceive the problem of green innovations, and see it as “the concept is to reduce the environmental impact, which is caused by production and consumption” (Ślęzak, 2020, p. 66-67). In both countries it is a part of the law that is still developing. Over the last year, Poland and Georgia have adopted many documents and strategies that are directly or indirectly related to green innovation. Therefore, regulations and solutions for green innovations change very quickly and frequently. This is the result of constantly growing knowledge and awareness in the field of environmental protection. It is worth emphasizing that most of the changes in this respect in Polish law result from our membership in the European Union. In the case of Georgia, many changes are related to the development of Georgia and its attempt to adjust to international standards in the field of IP.

The lack of a single legal act regulating the issue of green innovations in a comprehensive manner in both analysed countries certainly complicates the interpretation and application of this part of the law. In both analysed countries, green innovations, are the part of law that is still forming and its application lacks clarity and consistency. What is more, another important barrier to eco-innovation are mainly of economic nature.

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