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***Review on the Role of Green Technologies in
Hungarian Policies Concerning Sustainability***¹

1. INTRODUCTION - WHAT IS SUSTAINABLE DEVELOPMENT?

In the last years and decades the concept of sustainable development has progressively come into the foreground, which resulted in that sustainable development is an inevitable common pillar of technical, economic and social sciences. Sustainable development is a goal and also a tool in the scope of the welfare of human mankind. This paper would like to lighten up some cornerstones of the Hungarian regulation regarding sustainable development. Furthermore, the study focuses on green innovation² and green technology, and introduces key Hungarian action plans and national strategies concerning sustainable development.

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² Under the term innovation this study means the Schumpeterian interpretation, i.e. such new combination of existing materials and forces in the economy which create new consumer demands and habits. In this sense, innovation is not a response for demand because it is so new that it basically changes our needs. Innovation alters our values what we have already got used to. Schumpeter defines five territories of innovation: (1) new goods or improvement quality of existing goods, (2) new processes in the industry, (3) new market, (4) conquering new resources independently from their previous existent and (5) establishment of a new organization. See SCHUMPETER, JOSEPH A.: *A gazdasági fejlődés elmélete* [The Theory of Economic Development], 1980, Közgazdasági és Jogi Könyvkiadó, Budapest, 110-111.

First of all, it is worth mentioning briefly why green technology and protection of the environment is important within the concept of sustainable development. From 5th to 16th June 1972, United Nations Conference on the Human Environment was held in Stockholm, which was the first international summit where issues regarding protection of the environment were in the foreground. The result of the conference was the adoption of The Stockholm Declaration on the Human Environment, consisting of 26 principles connecting to the environment.³ At the same time, the United Nations (hereinafter: UN) created the United Nations Environment Program (UNEP), the main task was the protection of human environment through global supporting programs. These were the first steps in the path of the concept of sustainable development; however, the notion itself was created later.⁴

The idea of sustainable development was born in the context of ecological and economic interdependency. In 1980 – as the result of cooperation of more UN agencies –, the World Conservation Strategy was accepted, which served to redefine environmentalism in the post-Stockholm era. The strategy recognized that environmental issues needed long-term actions and solutions, and environmental and developmental objectives were strongly bounded.⁵ The World

³ See <http://www.unep.org/Documents.Multilingual/Default.asp?documentid=97&articleid=1503> [cit. 2014-01-04].

⁴ CARROLL, ELLIE: Twenty-five Years in the Making: Why Sustainable Development Has Eluded the U.N., And How Community-driven Development Offers the Solution, in *Houston Journal of International Law*, Vol. 32. Issue 2. (2010) 549.

⁵ BRAGDON, SUSAN H.: The Evolution and Future of the Law of Sustainable Development: Lessons from the Convention on Biological Diversity, in *The Georgetown International Environmental Law Review*, Vol. 8. Issue 3. (1996) 423. As section 2 of the strategy says: “Humanity’s relationship with the biosphere (the thin covering of the planet that contains and sustains life) will continue to deteriorate until a new international economic order is achieved, a new environmental ethic adopted, human populations stabilize, and sustainable modes of development become the rule rather than the exception. Among the prerequisites for sustainable development is the

Charter of Nature had the same conclusion in 1982, which declared that natural resources should be exploited in a way that the optimum sustainable productivity could be achieved and maintained on a permanent level.⁶

The four years between 1983 and 1987 were crucial from the perspective of creating the notion of sustainable development. In 1983, the UN General Assembly adopted Resolution Nr. 38/161., which set up the World Commission on Environment and Development (WCED) led by Gro Harlem Brundtland, Prime Minister of Norway.⁷ The main task of the commission was to make long-term propositions (to the year 2000 and beyond) for the UN about environmental strategies for achieving sustainable development and to promote interrelationships between people, resources, environment and development.⁸ The first meeting of

conservation of living resources.” *World Conservation Strategy*, 1980, International Union for Conservation of Nature and Natural Resources, available at: <http://data.iucn.org/dbtw-wpd/edocs/WCS-004.pdf> [cit. 2014-01-04].

⁶ DANAHER, JOHN: Protecting the Future or Compromising the Present?: Sustainable Development and the Law, in *Irish Student Law Review*, Vol. 14. Issue 1. (2006) 118.

⁷ Therefore, the commission is often referred to as the Brundtland Commission. Setting the Commission up was necessary because of the huge global changes in the world. Prior to 1983, the pollution had been continuously increasing, the overpopulation had been gathering speed and the scissor between poor and rich countries had been opening unstoppably wider. These problems could be caused by the industrialization of developed countries. However, they were not isolated problems because of global interdependency they required (and requires also nowadays) global solutions. No one could expect from the developing countries to give up their development because the developed countries in the “northern fortress” had been exploiting and partially destroying the Earth which could not bear any more developed countries. See BRUNDTLAND, GRO HARLEM: Taking Stock of Sustainable Development at 20: What We Have Accomplished and What Comes Next? in *Pacific McGeorge Global Business & Development Law Journal*, Vol. 21. Issue 2. (2008) 155.

⁸ CARROLL: *op. cit.* 550.

WCED was held in 1984, and after 900 days of work (which included such environmental disasters like the 1986 Chernobyl catastrophe) the widely known report of the commission, entitled *Our Common Future* had been published in 1987. One of the greatest achievements of the report is to set up the first notion of sustainable development. The report says “humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs.”⁹ The two key factors of the notion are needs (primarily, the needs of poor people), for which unconditional priority should be ensured and the idea of limitations called upon by technological advancement and the society to maintain the ability of environment to satisfy the needs of humanity.¹⁰

The notion of sustainable development does not explicitly cover the protection of the environment or the sparing, preserving and effective use of natural resources; however, it implicitly contains these meanings, as well, due to the fact that future generations can only receive natural resources of the Earth if contemporary generations use them effectively and economically.¹¹

⁹ A/42/427, *Our Common Future: Report of the World Commission on Environment and Development, From One Earth to One World*, section 27., available at: <http://www.un-documents.net/ocf-ov.htm#I.3> [cit. 2014-01-05].

¹⁰ GELLÉRTHEGYI, ISTVÁN: A környezetvédelem nemzetközi szabályozásának fejlődése [The Development of the International Regulation of the Environmental Protection], in *Pro Publico Bono Online TÁMOP Speciál*, 2011. Available at: http://www.propublicobono.hu/pdf/GELL%C3%89RTHEGYI%20ISTV%C3%81N%20A_k%C3%B6rnyezetv%C3%A9delem%20...%201.pdf [cit. 2014-01-05].

¹¹ The concept of sustainable development by the Brundtland Commission focuses on humankind. Therefore, Brundtland suggested investing itself in humanity through fighting off poverty and increasing the level of education and healthcare. See BUGGE, HANS CHRISTIAN – WATTERS, LAWRENCE: *A Perspective on Sustainable Development After Johannesburg on the Fifteenth Anniversary of Our Common Future: An Interview With Gro*

The next fundamental milestone in the history of sustainable development was the United Nations Conference on Environment and Development (UNCED), or as commonly called, Earth Summit, held in Rio de Janeiro in 1992, where 176 states gathered together.¹² The conference adopted – among other relevant documents – the Rio Declaration on Environment and Development and Agenda 21. In these documents member states emphasized that the idea of sustainable development is able to give a solution for social and economic crises in the world: opposition between north and south, unsustainable economies, climate change, lessening biodiversity, destroying rainforests and similar global cataclysms. This way the idea of sustainability pervaded the Convention on Biological Diversity and the United Nations Framework Convention on Climate Change, which were also signed in Rio. The Rio concept of sustainable development is strongly anthropocentric, which was openly opposed by the NGO Global Forum, – a conference held by non-governmental organizations at the same time as Earth Summit – and in the adopted Earth Charter they explicitly denied this human-centric (or anthropocentric) approach. According to their opinion, humanity is not the center of life but a component of nature and Earth, only the part of these.¹³

Half of the 27 articles of the Rio Declaration contain the words ‘sustainable development’ but it did not give a new definition. From

Harlem Brundtland, in *The Georgetown International Environmental Law Review*, Vol. 15. Issue 3. (2003) 363-364.

¹² The early 1990’s brought an interesting and very intense debate about the connection of trade and environment protection. The effects of the work of Brundtland Commission and the forthcoming UNCED with the simultaneously running GATT revision made a fertile soil to ensure the implementation of environmental aspects in the economy and trade. In more detail see: HORVÁTHY, BALÁZS: Környezetvédelmi szempontok integrálása a WTO szabályozásába [The integration of environmental aspects into the regulation of WTO], in *Állam és Jogtudomány*, Vol. 54. Issue 3-4. (2013) 98.

¹³ BOSSELMANN, KLAUS: Rio+10: Any Closer to Sustainable Development? in *New Zealand Journal of Environmental Law*, Vol. 6. (2002) 302.

the “spirit of Rio” one can derive that the concept of sustainable development links together rich and poor countries through their common interests in maintaining an ecologically sustainable economic system because only this can ensure the needs of future generations. It tries to lay a bridge between environmentalism and economic growth.¹⁴

As the corollary of the Earth Summit, the international regulation of environmentalism got a boost by the end of the 1990s; however, around the Millennium states realized that the aims of the Rio conference did not succeed, the world was still fighting against enormous poverty, unsustainable lifestyle and degradation of environment. In addition, the gap between rich and poor countries was getting wider. These problems called upon the World Summit on Sustainable Development (WSSD) in Johannesburg in 2002, its main task was to strengthen the institutional background of sustainable development.¹⁵ Two relevant documents were adopted under the aegis of the conference – the Johannesburg Declaration and the Plan of Implementation –, which, on the one hand, reconfirmed the Rio obligations, on the other hand, emphasized societal aspects of sustainable development which founded the three-pillar model of sustainable development that stands on the economy, society and the protection of the environment.¹⁶

Between 20 and 22 June 2012, the United Nations Conference on Sustainable Development (UNCSD) was held, which also referred to Rio+20 because it was also held in Rio de Janeiro, 20 years after

¹⁴ BRYNER, GARY C.: Policy Devolution and Environmental Law: Exploring Transition Towards Sustainable Development, in *Environs, Environmental Law and Policy Journal*, Vol. 26. Issue 1. (2002) 10.

¹⁵ BEYERLIN, ULRICH: Strengthening International Governance for Sustainable Development: Expectations for the 2002 Johannesburg World Summit, in *Potchefstroom Electronic Law Journal*, Vol. 5. Issue 1. (2002) 1.

¹⁶ This tendency was totally against the anti-anthropocentric ideology of the Earth Charter. For the Hungarian extending of the three-pillar model see footnote 65.

the Earth Summit, as a 20 years follow-up measure. The main aim of the conference was to bring the widest circle of international policymakers together again to shape how the world can reduce poverty, advance social equity and ensure environmental protection on an ever more crowded planet to get we want in the future. The conference focused on two themes: i) green economy in the context of sustainable development, poverty eradication and ii) institutional framework for sustainable development. Within these themes, seven priority areas were identified like decent jobs, energy, sustainable cities, food security and sustainable agriculture, water, oceans and disaster readiness. The main outcome document of the conference is entitled “The Future We Want”, within which member states renewed the commitment towards sustainable development and ensured the promotion of an economically, socially and environmentally sustainable future for our planet, and for present and future generations.¹⁷ The document contains 283 sections, and among many other points it details why green economy and green technology are important and how we can use them as tools to achieve sustainable development.¹⁸

2. GREEN ECONOMY IN HUNGARIAN POLICIES

2.1. Sustainable development as a constitutional requirement

On 18th April 2011, the Hungarian Parliament adopted the new constitution, called Fundamental Law, which came into effect on 1st January 2012. It has more commitments towards green economy and the protection of the environment under the aegis of sustainability. The first part of the Fundamental Law is the National Avowal, which

¹⁷ This wording still refers to the definition of Our Common Future, as the Brundtland Commission defined sustainable development.

¹⁸ The wording of The Future We Want is quite different from the previous texts, it uses an intellectual or emotional layer, concentrate on the individual activity. This is a key factor and alteration from the previous periods (where – more or less – the states recieved special duties and tasks).

says “We commit to promoting and safeguarding our heritage [...] with all man-made and natural assets of the Carpathian Basin. We bear responsibility for our descendants; therefore we shall protect the living conditions of future generations by making prudent use of our material, intellectual and natural resources.” This statement refers to the definition of sustainable development created by the Brundtland Commission. The legal nature of the National Avowal is controversial; however, Article R (3) of the part entitled Foundation prescribes that provisions of the Fundamental Law shall be interpreted in accordance with the National Avowal. This way it has legally binding nature (as an interpretative tool).

Article P, however, means a clear commitment towards sustainable development: “Natural resources, in particular arable land, forests and the reserves of water, biodiversity, in particular native plant and animal species, as well as cultural assets shall form the common heritage of the nation; it shall be the obligation of the State and everyone to protect and maintain them, and to preserve them for future generations.” This provision ennoble environmental protection to a constitutional value. Through Article 30. (3), it gets an institutional protection from the Deputy of Commissioner of Fundamental Rights whose duty is to protect the interests of future generations.

From the aspect of human rights, Article XXI. (1) creates an obligation to recognize and ensure right to everyone to a healthy environment. The right for healthy environment is different from the other classic human rights and social rights because it has a special subject what makes it a typical third generation human right. However, it does not mean that it would be a mere state aim or declaration without legal binding. The right for healthy environment is primarily an individual protection of legal instrument, videlicet a special human right which determining side is the objective legal aid. According to the interpretation of the Constitutional Court [Decision 28/1994. (V. 20.)], the right for healthy environment means a state obligation to take the necessary provisions in order to protect the environment. However, the level of protection is not arbitrary, legal protection cannot be reduced just increased. The only exception is

when reducing is inevitable for the protection of other human rights but proportionality is always a condition.¹⁹

The last relevant provision in the Fundamental Law is Article 38. (1), where the Parliament declared that management and protection of national assets shall aim at serving public interest, meeting common needs and preserving natural resources, as well as taking the needs of future generations into account. This sentence establishes the financial background and obligation to enforce environmental protection.

2.2. National Sustainable Development Strategy

As described above, it is now understandable how environmentalism became more and more important and how the issues of green economies and green technologies had come into the center of sustainable development. The commitments in the aforementioned legally binding treaties and non-binding declarations were taken onto international level, most of it as soft law instruments but the execution of these commitments demands global, regional and local actions. The network of thousands of local actions – coordinated on regional and global levels – is only able to achieve the appointed developmental goals. The commitments in Fundamental Law are in harmony with these legal documents; however, they make a clear obligation to enhance the legal regulation. The results of these obligations are numerous strategies and action plans, the most important of them are introduced in this paper.

In the last seven years there were more strategies and action plans in Hungary (under different governments) which focused on the accomplishment of these developmental goals through regulating and facilitating the use of green technologies.

The first remarkable step was the National Sustainable Development Strategy (shortly NSDS), adopted in June 2007. The strategy is a long-term framework that integrates more domestic sectors, so it is coherent with the goals of sectoral strategies and

¹⁹ SÁRI, JÁNOS – SOMODY, BERNADETTE: *Alapjogok* [Fundamental Rights], 2008, Osiris, Budapest, 317-322.

programs. NSDS consists of four main parts: i) the first is an introductory part about the concept of sustainable development, ii) the second is the analysis of the contemporary situation, iii) the third contains the priorities, goals and tasks, and iv) the fourth is about the overarching tasks and means of implementation.

From the scope of green economy, the analysis of the domestic processes and measures has two core elements: environment and economy. Within the part of environment, the current situation of air pollution, land use, state of soil, surface waters, drinking water, wastewater, waste, man-made environment, natural values, biodiversity and climate change were analyzed. The analysis identified urgent and serious problems only in a few areas. One of these is that apart from large towns and main transport junctions, air pollution has diminished but motorization has increasing impacts. The proportion of the areas withdrawn from agricultural use and built up has substantially increased in the previous decade.²⁰ There are also worried words concerning man-made environment which condition has permanently been declining and historical architectural values of Hungary are particularly endangered. Increasing problems are caused in municipalities by rising emissions of certain air pollutants from transport congestions, the increase of noise and vibration loads, as well as the shortage of green areas.²¹

After 1990, the structure of economy has changed, which resulted in the degradation of heavy industries and mining. This tendency has a huge beneficiary impact on the environment, the later increasing volume of industries – because of economical and industrial modernizations and new environmental regulations – did not bring such a big pollution like it had been before 1990, and previous environmental threats had ceased. The general goal of

²⁰ The agricultural land shrank by 300 000 hectares between 1994 and 2004. See *Nemzeti Fenntartható Fejlődés Stratégia* [National Sustainable Development Strategy], June 2007, Government of the Hungarian Republic, 20., available at: http://www.nfft.hu/dynamic/national_sustainable_development_strategy.pdf [cit. 2014-01-07].

²¹ Ibid. 20-24.

segregating economic growth from increasing environmental loads was apparently accomplished.²²

The structure of the use of sources of energy has altered in Hungary since the change in the political system. Natural gas consumption has increased but the use of energy-efficient technologies has slowly increased. Hungary consumes significantly less per-capita but regarding the unit of GDP, it consumes significantly more energy than developed countries. The rate of use of renewable energy sources is low but shows increasing tendency. Before the adoption of NSDS in 2003, it had been 3,6 %, in 2005 in turn it was 5,2 %, comparing to the overall energy utilization.

The analysis emphasizes that Hungarian progress is worthy of international recognition in the area of environmental protection in relation to transportation; however, it still goes together with an increasing rate of air-pollution.

The analysis has a bad picture regarding green technologies. It says:

Production and consumption of product and services meeting sustainability requirements began in Hungary after the change in political system in the mid-1990's, but no material progress has been observed to date, despite the fact that Hungary has substantial reserves for organic farming, given its good agricultural resources and indigenous livestock varieties. The low level of environmental awareness among residents and the low incomes of large groups of the population (leading to a price-sensitive consumer behavior) coupled with large supplies of cheap mass product prevent environment-friendly product from becoming more popular and from making up increasing proportions of product available in shops.²³

The institutional framework for eco-friendly products and services was created by the domestic environmental policy but without

²² Ibid. 24.

²³ Ibid. 28.

significant resources the results were not realized. However, as NSDS says, it was the same situation in most European countries.

The final relevant statement in this field is that prices of natural resources do not sufficiently reflect their scarcity and the cost of their ecological impacts.²⁴

NSDS defines eleven priorities that are necessary to fight against the identified tendencies which undermine sustainable development. Connecting to green economy, the fourth priority is the protection of natural values, the fifth is combating climate change, the sixth is sustainable water management, the eighth is the strengthening of sustainable production and consumer habits, the ninth is the transformation of energy economy in Hungary, and the eleventh is sustainable economic regulation. The fourth, fifth and sixth pertain to the preservation of the carrying capacity of the environment and the eighth, ninth and eleventh pertain to the development of the economy.

It is a core aim to preserve the viability of natural ecosystems. This requires the preservation of biological diversity (see the Rio Convention) and the sustainable use of natural resources. Five fields of action were identified. Firstly, it is necessary to actively protect our natural values, which can be done through proper environmental regulation, horizontal and zonal programs built upon each other. Secondly, there is a need to integrate the actors of economy with legal tools, especially in agriculture, spatial development, tourism, mining, hunting and fisheries. Thirdly, institutional protection should be strengthened by sufficient resources. The fourth factor is the change of lifestyle and attitude of society in order to strengthen environmental awareness and encourage people to adapt to

²⁴ In everyday political communication household overhead reduction is a key factor (it could be pivotal in the elections). But reducing the price of electricity, water, gas and heating reflects the scarcity of these resources less and less, which could lead to an unsustainable waste because people often cannot esteem cheaper things, especially when they took it axiomatic that these services will last indefinitely because in a democracy it is their basic right.

sustainable modes of life.²⁵ And the fifth field of action is the active contribution of the society, which requires permanent institutional communication.²⁶

Climate change has effect on various fields; therefore, actions against it demand harmonized steps in many fields. The main objective is to reduce emissions of greenhouse gases into the atmosphere and to prepare for and adapt to the impact of changing weather patterns and climate. The reduction of gases involves green technology in many areas like energy consumption, construction patterns, transport needs and industrial activities. On the one hand, changes in these fields could reduce the emission of greenhouse gases and on the other hand, they could facilitate the sustainable use of non-renewable natural resources and encourage the use of renewable resources.²⁷

Sustainability goals relating to waters include economical and value preserving ways of water management and preservation of waters for future generations. These goals involve water-saving and pollution-free green technologies of water use which are able to maintain the quantitative balance in artificial water circulation.²⁸

Amongst the economical priorities, the first important step in the scope of this paper is the improvement of sustainable production and consumer habits. The basic statement of this part is the obligatory necessity of reducing the needs of natural resources in the field of production and consumption. This can be achieved with eco-efficient technologies and investments into ecological innovations. These factors not only help the maintenance of environmental sustainability but the achievement of competitive advantage, as well. Eco-efficient technologies are able to ensure the satisfaction of needs for consumer goods at lower environment cost. The change in the structure of economy is only one side of the coin, the other one is the change of consumer habits. In my opinion, this is a more difficult

²⁵ See supra note why realizing this aim would be so hard.

²⁶ *National Sustainable Development Strategy*, 38-40.

²⁷ Ibid. 40-41.

²⁸ Ibid. 41.

task. Such kind of consumer patterns should be spread which have lower needs for material input and energy. These can only be achieved with long-term supporting programs and adequate tax-management, and eco-efficient technologies should be promoted within public procurement procedures, as well. With the appropriate financial support the R&D&I sector can be shepherded towards the ecological way. It goes without saying that proper waste-management and recycling with green technologies are necessary to reduce environmental loads, as promoted measures say at NSDS.²⁹

Energy issues are not only matters of supply and environment but of serious national security and competitiveness, as well. The strategy suggests altering energy management regime in a way that it enables reducing the emission of greenhouse effect gases and hunger for energy should be fed from local renewable energy sources. Of course, energy management has a huge impact on the aforementioned areas as well because economy and ecology have a strong interdependency. Green technology has in important role in energy management. Firstly, the energy-cost of production can only be reduced with cleaner and newer technologies. Secondly, energy-efficiency can be improved with primer, local energy sources³⁰ instead of power from the grid, what generates great losses through multiple conversions. Thirdly, better heat insulation and more energy-efficient household machines can reduce household and communal energy consumption. Fourthly, the need for energy in the private and public transport sector can be diminished with eco-friendly technologies, especially with new types of fuel like second generation bio-fuels, GTL fuels produced from biogas, experimental hydrogen fuel. The EU aims at increasing the share of bio-fuels to at least by 10 % by 2020 in transport.³¹

²⁹ Ibid. 43-44.

³⁰ For example geothermal heating, ground heat pumps, solar energy collectors, biomass utilization.

³¹ *Nemzeti Fenntartható Fejlődés Stratégia* [National Sustainable Development Strategy], 46-47.

The previously introduced elements of sustainability would only be utopian ideas without proper regulations and obligatory forces. Regulation is the tool for reaching sustainability aims. As it was previously outlined, taxation is one of the most important tools. “The transformation of the taxation policy must be guided by the requirement that burdens should be focused on material and energy intensive activities, those that deteriorate the environment and harm human health. This could shift the production and consumption towards the less energy and material intensive modes.”³² In the support policy open and covert support of polluting and harmful activities must be terminated and ecologically acceptable and socially useful activities should be supported as strong as possible. The strategy promotes the wide-spread use of the word “eco-efficiency” where ‘eco’ refers to both economically and ecologically efficient methods. This represents the integration of environmentalism and economy under the scope of sustainable development, as it was conceptually created in the early 1990s (see above). NSDS tries to create balance between governmental intervention and corporate self-regulation; therefore, it promotes the spread of responsible enterprise concept which is the cheapest and ecologically safest solution. The creation of conditions to spread this concept requires long-term thinking but results will appear.

2.3. New Széchenyi Plan

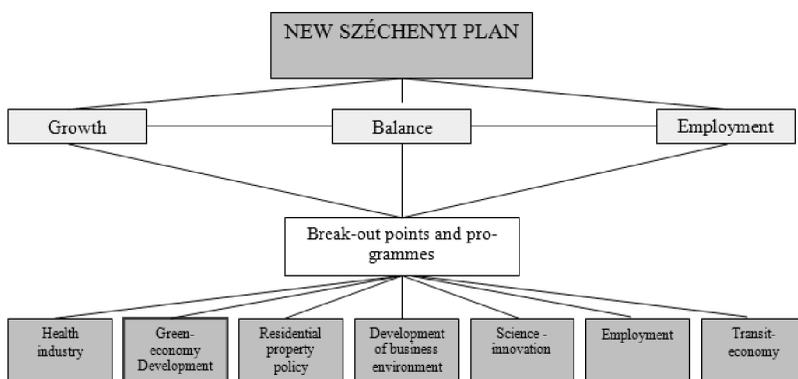
The Government of Hungary adopted the so-called New Széchenyi Plan³³ (shortly NSZP), the Development-policy Program of Recovery, Renewal and Ascension on 14th January 2011. The main objective of NSZP is to strengthen Hungarian competitiveness and

³² Ibid. 50.

³³ The name of the plan refers to István Széchenyi (1790-1860), a Hungarian politician, theorist and writer, often called as the Greatest Hungarian. With his political and economical thoughts he determined the age of reforms in the 1820s, 1830s and 1840s. His ideas became huge successes which ascended the contemporary Hungary into the elite of the European countries.

ascension of the economy. This is an answer to the financial-economic crisis which has affected Hungary as well in the last six years. NSZP is a tool for distribution of domestic and European Union supports. At the time of writing this paper, a calculator on the official website of NSZP showed that the amount of payments got from the EU was more than 5.000 billion Hungarian Forint (cca. 16 billion Euro).

The following figure shows the system of NSZP:



1. Figure: New Széchenyi Plan, 2011, Budapest, 27.

The highlighted box shows the important part of NSZP from the perspective of this paper.

Four priorities are identified within the Green-economy Development Program:

1. green energy;
2. energy-efficiency;
3. green-education;
4. green R&D&I.

These priorities include more sublevels.

1. The basic principle of this program is the recognition of the need to change from non-renewable fossil energy-sources to alternative, renewable, principally green and clean energy-sources. This will be the basic of a new and sustainable economic model. The

Renewable Energy Road Map,³⁴ envisaged by 2020, includes a 20% average rate of utilizing renewable energy-sources in the EU, which inclined the Hungarian government to create this action plan on a domestic level to reach the goals defined by the EU and undertaken by Hungary, which is at least 14,65 %.³⁵

The planned use of renewable energy-sources has multiple pillars like biomass, biogas, bio-fuels, geothermic and thermal energy, solar, water, and wind energy.

The subprograms of the green energy development focus on green transport,³⁶ energy-efficient lighting upgrade, supporting the production of decentralized renewable and alternative energy, agricultural energy,³⁷ waste industry,³⁸ and green sample projects.³⁹ In order to reach these goals, NSZP suggests more tools which are mainly connected to the creation of a more efficient and rational support and tender system, simplification of official authorization processes and capacity building.⁴⁰

2. NSZP identifies low energy-efficiency as one of the main obstacles to leave economic depression behind. Half of the flats in Hungary are non-conform to modern insulation and heating requirements. In the case of public buildings, this rate is even worse.

³⁴ Communication from the Commission to the Council and the European Parliament, 848, 10. 1. 2007.

³⁵ *Új Széchenyi Terv* [New Széchenyi Plan], 2011, Budapest, 107-109. Available at: http://www.mnvzrt.hu/data/cms576186/Uj_Szechenyi_Terv.pdf [cit. 2014-01-22].

³⁶ The aim of this subprogram is the modernization of public transport not only through the production of alternative fuels but through the improvement of infrastructure and production of alternatively powered vehicles, as well.

³⁷ The energetic or miscellaneous utilization of renewable commodity and by-products originating from agriculture.

³⁸ The energetic or miscellaneous utilization of agricultural and communal waste.

³⁹ Introduction of know-how's and good practices, supporting the complex projects of Hungarian innovative technologies.

⁴⁰ *Új Széchenyi Terv* [New Széchenyi Plan], 114-115.

Energy-import dependency in Hungary is very high, which makes a more urgent matter to reduce unreasonable energy-waste. 40% of the overall consumed energy is used in buildings, from which two-third goes for heating and cooling. CO₂ emission in the buildings is much higher than in the industry, transport or agriculture. Building energy is one of the main priorities in the EU, as well. Saved energy, what is called “Negajoule” by the European Commission, is the biggest energy resource nowadays. NSZP takes into account that building energy-efficiency issues mainly affect the poor and underprivileged groups of society, which circumstance integrates energy-efficiency programs into the targets of economic development and social policies.⁴¹

The tools of the improvement of energy-efficiency are the same as in the previous section: in the first place, it is emphasized that sufficient tender-management, capacity and administration are crucial. This includes an applicant-friendly attitude (easy and logical processes, less rigorous methods) and wide tender portfolios which suit different needs. The predictability is, or should be an important factor in the world of tenders. Applicants should know the date of publication of tenders, the application deadlines (which are often too short) and the announcement of results in advance.⁴² In numbers, the desired objective by the year of 2020 is at least 60% energy saving of investments in average, and 25 kWh/m²/year energy consumption in new built buildings. NSZP takes the adequacy of Directive 2010/31/EU of the European Parliament and the Council (19th May 2010) on the energy performance of buildings into account, which requires measures from member states to reach minimum energy performance in most buildings. Article 9 obliges members to ensure that by December 2020, all new buildings shall be nearly zero-energy buildings and after 31st December 2018, new buildings

⁴¹ Ibid. 131-134.

⁴² Ibid. 134-145.

occupied and owned by public authorities shall be nearly zero-energy buildings.⁴³

3. The third priority focuses on education and employment. The green-employment subprogram aims at generating 150-200 thousand new sustainable jobs in the green-economy and launching green public work programs for the less qualified workforce. These tasks can be carried out with different supporting measures which enhance green investments, especially in the field energy-efficiency.⁴⁴

The green-education subprogram aims at creating quality-oriented education of industrial, agricultural and energetic experts in the scope of green technologies. This requires short term (1 year) programs, mid-term (1-3 years) skilled workmen, MSc programs and long-term (3-5 years) BSc and PhD programs.⁴⁵

The third subprogram is the green view-form subprogram which only consists of a few soft-measures to increase the green-consciousness of people with PR and advertisement tools.⁴⁶

4. The above-mentioned fields are based on high-quality knowledge, therefore, green R&D&I is a crucial base to build up other green programs. The rate of innovation in the proportion of GDP is lower than the European average. By 2020, Hungary should reach the 2% R&D&I rate of GDP, which is 20% in the field of green innovation. NSZP gives a list about support-worthy energetic innovations. These are connected to the defined priorities in energy and energy-efficiency programs, so the core issue is to change exhaustible natural resources to renewable resources like biomass, water, wind, solar and geothermic energy, and to reduce the environmental loads with CO₂ emission reducing technologies or

⁴³ In the use of the Directive nearly-zero energy buildings mean the calculated or measured amount of energy needed to meet the energy demand associated with a typical use of buildings which includes, inter alia, energy used for heating, cooling, ventilation, hot water and lighting.

⁴⁴ *Új Széchenyi Terv* [New Széchenyi Plan], 141-145.

⁴⁵ *Ibid.* 146.

⁴⁶ *Ibid.* 147-149.

invent new – environmentally less harmful – technologies in water management and public transportation.⁴⁷

2.4. National Environmental Technology Innovation Strategy 2011-2020

On 6th September 2011, the Government adopted Decision No. 1307/2011 on National Environmental Technology Innovation Strategy (NETIS) for the period of 2011-2020. NETIS – as the previous strategies – also recognizes the need for change because of the multiple global crises related to food, fuel, freshwater and finance. The basic idea of NETIS is the strong connection between innovation and green growth. As it says, “innovation has an important role in generating employment, enhancing productivity growth through knowledge creation and diffusion in the post-crisis context”.

NETIS is supposed to be the crucial framework to achieve the goals of the EU 2020 Strategy, especially, the Innovation Union initiative. The adoption of the strategy aims at shifting towards green economy through environmental technological innovation. In the scope of NETIS, those environmental technologies mean solutions which are associated with lower environmental loads, rather than traditional existing processes. These include technologies and processes which care with pollution, less polluting and less resources-demanding products and services, and methods and structural innovations which make resource-utilization more efficient.⁴⁸

NETIS focuses on three main issues around product technologies, process technologies, process technologies and know how procedures and organizational and managerial procedures. The strategy is a mix of different policies, shown by the following table:

⁴⁷ Ibid. 151-154.

⁴⁸ *Nemzeti Környezettechnológiai Innovációs Stratégia*, [National Environmental Technology Innovation Strategy], 2011, Ministry of Rural Development, Budapest, 4.

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Vision and Objectives	Policy tools – measures
<ul style="list-style-type: none"> • Foster environmental industry, technology, • Increase share of environmental related innovations, competitiveness, • Paradigm shift: from end-of-pipe approach to prevention, • Increase effectiveness, • Decrease primary material use, • Increase reuse/recycling, improve resource-efficient services 	<p>Greening governance - increase internal government cooperation including authorities and local governments,</p> <p>Legal tools: Innovation friendly legal system (e.g. simplification of administrative procedures, pressure to comply with legal requirements, extension of producers' liability)</p> <p>Economic instruments:</p> <ol style="list-style-type: none"> 1. Green tax system; 2. Green public procurement; 3. Supporting environmentally friendly subsidies (removing environmental harmful ones). <p>Social tools: raising awareness, improving green education, management and consultancy</p>

1. table⁴⁹

NETIS takes the three pillar system of sustainable development into account and recognizes that complex issues demand complex answers which involve the harmonization of many different policies like social, economical and legal policies.

NETIS has nine improvement directions with detailed targets which are more or less overlapped with the previously introduced strategies.

⁴⁹ Source: ILLÉS, ZOLTÁN (ed.): *National Environmental Technology Innovation Strategy*, 2012, Ministry of Rural Development, Budapest, 8. Available at: http://kornyezettechnologia.kormany.hu/download/b/4f/50000/NETIS_English.pdf [cit. 2014-01-26].

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Intervention fields	Targets	Development areas
Horizontal type technological innovations	Sustainable resource management, resource efficiency, decrease of environmental loads.	Nanotechnology, biotechnology, use of photonics, bio-based products, advanced materials.
Air	Decrease air pollution made by transportation and households.	Improving public transport vehicles and traffic control, upgrading heating and energy efficiency.
Waste	Recycling, decreasing the organic content of waste, reducing waste production, less hazardous waste, selective collection of waste.	Low-waste technologies, separately collected waste processing, usage of waste as secondary raw materials.
Water	Decreasing specific water use in industry and agriculture, waste water recycling, ensuring high quality drinking water supply.	Water-efficient key technologies, water-saving agricultural technologies, iron and manganese removal technologies for drinking water.
Noise and vibration	Decreasing noise pollution in settlements, vibration protection.	Noise barriers, noise and vibration reducing traffic developments, sound insulation in buildings.
Construction industry	Eco-friendly construction, sustainable resource-management, energy-efficient buildings.	Building materials from renewable sources, usage of secondary raw materials and renewable energy sources, thermal insulation.
Renewable Energy	Efficient use of different renewable energy resources.	Heat pump energy use, waste heat capturing, heat energy recovering system, geothermal energy use, solar energy in households, biomass, small wind turbines, efficient energy storage, photovoltaic technologies.

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Remediation	Remediation of polluted compartments (soil, water) and monitoring, giving priority to the green remediation.	Bioremediation, innovative technologies, in-situ processes.
Agriculture and soil protection	Decreasing environmental pressure, soil protection, more efficient water use, decreasing the use of pesticides, reducing soil pollution and waste production.	Eco-friendly technologies, organic farming technologies, efficient use of nutrients, irrigation and water recycling technologies, biological agents with integrated pest management, waste energy recovery, usage of geothermal energy.

2. table⁵⁰

2.5. National Rural Strategy 2012-2020, and the Darányi Ignác Plan

On 21st March 2012, the Government adopted the National Rural Strategy (shortly NRS) and its implementation plan, the Darányi Ignác⁵¹ Plan (Government Decision Nr. 1074/2012 (III. 28.)). These action plans hold a lot of different subsystems with different aims and tools together in order to help the elevation of the Hungarian agriculture. The situation of agriculture and rural development is a very complex issue which requires societal, demographical, educational, geographical, economical and of course, technological interventions, as well. The overall objective of NRS is to increase the population carrying capacity and population holding capacity. The overall objective consists of three horizontal aspects: sustainability, territorial and societal cohesion, and city-country connection. These

⁵⁰ Source: ILLÉS: *op. cit.* 10-14.

⁵¹ The name of the plan refers to Ignác Darányi (1849-1927), a Hungarian lawyer, agrarian, minister. He was member in the Hungarian Scientific Academy. In his political career Darányi worked always for the boosterism of the Hungarian agriculture.

involve more strategic aims like the preservation of natural values and resources (this one serves the sustainability aspect), multicolor and vivid agricultural production, food security and food safety (these two serve the territorial and societal cohesion), growing employment in the rural sector and enhancing the quality of rural lifestyle (these serve the city-country connection). NRS divides the abovementioned strategic aims to seven strategic fields. Two of them are worth to emphasizing: the protection and sustainable use of natural values and resources, and the improvement of the quality of rural environment. These connect to sustainability through the first strategic aim. On the lowest level, NRS consists of 42 national strategic programs and 8 regional development programs to achieve these comprehensive goals. Some of them refer to green economy and green technology, what is worth a short view within the scope of this paper.

NRS takes the foreseeable three pillar model of the Common Agricultural Policy (CAP) into account. The second pillar is the sustainable use of natural resources which suggests that innovation should serve “green growth”, namely to reduce environmental loads and adapt to the consequences of climate change.⁵² The first program which serves greening is the Soil-protection and Natural Resource Management Program. This requires new technologies which are able to prevent or reduce the effects of soil-degradation factors, ensure fertility of the soil with natural resources, increase reservoir capacity of the soil and reduce unnecessary waste of natural resources.⁵³

⁵² At the end of 2013, CAP 2014-2020 was adopted which is “greener” than the previous ones and aims at a more sustainable EU agriculture. See: Overview of CAP Reform 2014-2020, in *Agricultural Policy Perspectives Brief*, No. 5. (2013), published by the European Commission. See http://ec.europa.eu/agriculture/policy-perspectives/policy-briefs/05_en.pdf, [cit. 2014-01-27].

⁵³ *Nemzeti Vidékstratégia* [National Rural Strategy], 2012, Ministry of Rural Development, Budapest, 65.

The Protection and Restoration of Natural Resources, Territories and Ecosystem Services Program focuses on the maintenance of biodiversity.⁵⁴ It is crucial to continue and improve the existing plant-variety and animal species preservation programs and the fight against invading species.⁵⁵

The Water Resource and Water Quality Protection Program aims at preserving the quantity and quality of one of our most important renewable but vulnerable natural resources: water. It demands advanced technologies which can reduce the waste of water. It is also important to reduce nitrate load originating from agriculture, which requires individual Nitrate Action Plan. Hungary is rich in thermal water; therefore, we have to take care of it with water-saving and energy-efficient methods of exploitation.⁵⁶

Within the frame of Drinking Water Quality Improvement Program, it is an objective to reduce arsenic, boron, nitrite, fluoride, ammonium, iron, and manganese concentration. Besides, upgrading drinking water network is also necessary to prevent secondary water quality degradation.⁵⁷

The Waste Water Program innervates used water sparing, the utilization of grey water⁵⁸ and the use of water-free technologies.⁵⁹

The Air Quality Protection and Noise Reduction Program aims at spreading energy-efficient eco-friendly transport methods and infrastructure, both in private and public transportation. It is also necessary to use greener heating systems and cleaner heating fuels which are also energy-efficient. It is desired to significantly reduce

⁵⁴ The Earth Summit in 1992 shows the strong connection of biodiversity and sustainable development.

⁵⁵ *Nemzeti Vidékstratégia* [National Rural Strategy], 66-67.

⁵⁶ *Ibid.* 68.

⁵⁷ *Ibid.* 69-70.

⁵⁸ Used water is created by hand washing or vegetable washing. It is not infectious like waste water, therefore, it is suitable for washing, watering the garden or flushing the toilet.

⁵⁹ *Nemzeti Vidékstratégia* [National Rural Strategy], 70.

air-pollution, noise and stink loads of agricultural fields, especially in animal farms.⁶⁰

Finally, a few words about Waste Management Program. Like the previous strategies, this one also urges the increasing amount of recycling and the settling of modern waste management facilities. Biomass which cannot be used as a by-product any more could be used in biogas or/and composting establishment to reutilize it.⁶¹

2.6. Jedlik Plan, National Strategy for the Protection of Intellectual Property

On 23rd September 2013, the Government adopted the Jedlik⁶² Plan with Decision Nr. 1666/2013., which is the first comprehensive governmental strategy focusing on intellectual property. It defines mid-term objectives for the years of 2013-2016. The Jedlik Plan prescribes more than one hundred measures along the forty action directions. The Jedlik Plan has four pillars: industrial property law, copyright law, the use of IP in the service of national sectoral policies and institutional issues.

The Jedlik Plan has more horizontal connection points with other sectoral policies. For example, the New Széchenyi Plan identifies knowledge as an outbreak point of the Hungarian economy. Amongst the sources of economic growth, one of the most important ones is innovation, which can give a huge competitive advantage in the current financial-economic depression.

The abovementioned strategies foster green innovation in the field of agriculture and also regarding the protection of the environment. They operate with more efficient tenders and tax regulations to enhance the volume of innovations. However, nowadays, the costs of innovations are huge and these tools are not

⁶⁰ Ibid. 71.

⁶¹ Ibid. 72.

⁶² The name of the plan refers to Ányos Jedlik (1800-1895), Hungarian scientist, inventor, Benedictine. He researched mainly the electricity, many of his inventions connect to electric power. Jedlik invented the soda water machine as well.

sufficient to pay off the costs. The best tool for investors what can promise extra profit with the biggest chance is intellectual property law. The different types of protection provide exclusive rights to the rightholder, which can make innovations profitable in long term, as well.

The third pillar – the use of IP in the service of national sectoral policies – introduces the connection of green economy and industrial property under chapter 4.3.2. It lays down the basic concept that amongst global crises (climate change, increasing energy hungry, unpredictable change of energy price) sustainable (energy-efficient) development can only be maintained through the protection of natural resources, the preservation of biodiversity and the full exploitation of renewable resources. Such an economy is necessarily a green economy.⁶³

Relevant fields of green economy from the aspect of industrial property are the followings:

1. alternative energy sources;
2. innovations in the field of environment protection industry;
3. environmental innovations in agriculture;
4. innovation connecting to waste management.

This list matches the focus points of the previously introduced strategies, which makes an inseparable bond between the different action plans. The Jedlik Plan emphasizes two types of protection which serve these innovations the best: patents that protect the innovation itself, and trademarks which help visualizing these innovations on the market. Utility models could also be useful tools; however, the number of granted utility models worldwide and domestically is significantly less than the number of granted patents, it is not a widespread form of protection, except in China. This could be the reason why it is not mentioned within this part.

⁶³ *Jedlik Terv, Nemzeti Stratégia a Szellemi Tulajdon Védelmére, 2013-2016* [Jedlik Plan, The National Strategy for the Protection of Intellectual Property], 187-188. Available at: <http://www.sztnh.gov.hu/jedlik-terv/Jedlik-terv.pdf> [cit. 2014-01-28].

The Jedlik Plan investigates domestic patent applications of green innovations between 2007 and 2012, which fits to the scope of this paper. In this period, the number of patent applications grew from 74 to 122. Significant growth was experienced in the field of wind energy, building insulation, recycling and agriculture. However, in these five years there were not any green patent applications connecting to vehicles or incineration, and bio-fuels were also underrepresented fields, however, these were important strategic points in all strategies. Unfortunately, the number of trademark applications in the 40. class of the Nice Agreement classification which refers to green energy, was continuously decreased.⁶⁴

Regarding new technologies, the timeframe between invention and the entry to market is quite important. The midsection is represented with the time of patent application process which varies case by case but in average it lasts 2,5 years, which is pretty good in international comparison. Many intellectual property authorities have special processes for the examination of green-patents, which can shorten the length of application process even with a year.⁶⁵

The volume of licensing and the effectiveness of right enforcement would also be an important indicator regarding the current situation of green technologies; however, Hungarian Intellectual Property Office (HIPO) does not have sufficient data to analyze these. It is not mandatory to apply patent and trademark licenses to the registry; therefore, HIPO cannot have full and authentic information. They have no data about right enforcement either because there was not any special investigation in the green economy sector.

An important connection point between HIPO and the New Széchenyi Plan is that a positive examination result about the novelty and inventive step published by HIPO during the patent application process means an advantage in tenders of the New Széchenyi Plan.⁶⁶

⁶⁴ Ibid. 189-190.

⁶⁵ Ibid. 192.

⁶⁶ Ibid. 191.

3. CONCLUSIONS

In the last years more national strategies were accepted which in some ways are connected to sustainable development and foster the use of more and more green technology to make the whole economy greener. These serve to protect the environment, which is one of the core dimensions of sustainable development. On the one hand, in the background of these strategies we find obligations from international law, and on the other hand, there are direct national obligations originating from the Fundamental Law, as described above.

The most suitable branch of law which can provide an effective intervention tool for the state is administrative law. Private law cannot really differentiate between green technologies or other technologies; it protects all intellectual creations the same way and provides the same rights to exploit these rights. However, administrative law gives a more direct state-control mechanism. As it has previously been written, the main equipment of encouraging innovation to move towards greening is the proper regulation of taxation and tendering operations. The socialist planned economy has a bad taste in the mouth, and after the change of political regime in the 1990s, it was not a popular idea to centrally plan the flow of the economy but after the EU accession this kind of economy control got a new impetus. Now, the state does not intervene directly but through tax and tender regulations it can indirectly affect the economy to reach the desired economic ways. The methods in a capitalist free economy are different than in the past regimes but the state-will for a central planning is the same.

Strategies were accepted quite frequently, year by year and there is a big overlap amongst them from the scope of fostering green economy. This raises the question whether previous strategies were really efficient or not. Or, for what else do we need newer ones? Are these plans able to determine the ways of economy? The number of patent applications is a good indicator of measuring the volume of high-profile green innovations. As the Jedlik Plan shows, in a few sectors of green innovation (like wind energy, energy storing, heat

insulation, waste management) considerable improvement can be observed. However, some industries like biomass or geothermic energy, vehicles or CO₂ emission reduction are almost unchanged. Despite of these numbers, in Hungary, geothermic and biomass energy production have, or should have the biggest role. The total amount of biomass is 350-360 million ton, of which only 10% is used for energetic goals. However, this low rate of utilization gives the 92% of our renewable energy production.⁶⁷ The question is why we cannot acknowledge the results of innovation in such an important energy industry field or in other lagging industries. One reason could be the extremely costly and time-consuming researches which cannot reach patentable status in a few years. In this case, frequent surveys can check the progress and it will be clear whether only time is necessary or something else is needed to make successful initiatives. A negative fact is that public-financed research centers (typically universities) have an extremely low intellectual property protection activity, which hampers economic exploitation of potential innovations. The Jedlik Plan identifies other unfavorable factors like the generally low intensity of R&D&I activity, the lack of sufficient capital of small and medium sized enterprises, the absence of result obligations for patenting in calling for tenders and the lack of presence of using intellectual property valuation methods.⁶⁸

On 28th March 2013, the Parliament adopted Decision Nr. 18/2013. on National Sustainable Development Framework Strategy for the period of 2012-2024. The strategy is different than the previous one. NSDS was more pragmatic; it defined core priorities and fields that need to be improved. This new strategy has a more

⁶⁷ CSÁK, CSILLA – JAKAB, NÓRA: Magyar Nemzeti Jelentés a mezőgazdaságról és a fenntartható fejlődés követelményéről [Hungarian National Report on the Agriculture and the Requirement of Sustainable Development], in *Agrár- és Környezetjog*, No. 12. (2012) 67-68.

⁶⁸ *Jedlik Terv* [Jedlik Plan], 190.

theoretical approach about sustainable development,⁶⁹ and rather gives a report about the current situation and takes care of institutional relations. The separate analysis of this strategy was unnecessary because it did not define any detailed directions above the natural commitment next to green economy and preservation of resources, rather just defined declarations and referred to the core points of the New Széchenyi Plan Green Economy Development Program. However, the report about the current situation does not prove any progress in greening. After 7 years from the adoption of NSDS, this new strategy diagnoses the overuse of natural resources, their quantity is lowering and their quality is demoting. Many problems afflict the environment which makes lifestyle worse and the environment poorer. Biological diversity is reducing, the resistance of ecological systems is irreversibly damaged and the ecosystem is exhausted.⁷⁰ The solution is to foster green innovation in order to create greener technologies to spare the environment and reduce its exploitation to take time for regeneration. However, the solution was the same years ago as well but as the current report shows, result did not appear and the processes did not turn or slow down. This makes the efficiency of the different strategies questionable. Partial successes were recorded; however, the global picture remained unchanged. It can occur that it is just the question of time but perhaps more radical tools will be needed to reach

⁶⁹ The biggest change is the different thinking about sustainable development. The strategy gives an additional pillar to the classical three-pillar system. Next to the environment, economy and society, the fourth core factor is the human in itself. An adequate number of healthy people with useful knowledge is the most important resource of the nation, therefore, we cannot allow to drop behind the poorest people and lose their abilities. In my opinion, humans and societal dimensions cannot be separated so strict because the community of humans gives the society; they are in a part-whole relationship. See further in *Nemzeti Fenntartható Fejlődés Keretstratégia 2012-2024* [National Sustainable Development Framework Strategy 2012-2024], published in Parliament Decision Nr. 18/2013 (III. 28.).

⁷⁰ Ibid. Annex 1. row E3.

sustainability. The best mark of recognition of bad tendencies is the pessimistic title of the Parliament decision which adopted the Framework Strategy: *The national concept of transition towards sustainability*. Longer transitional period means more distant sustainability. We can just hope that Hungary will not give up its sustainability goals and it will not be stuck in the transition for decades.

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